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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 179

Arvin Models 5175 and 5176 (Chassis TE-320) were covered in Photofact Folder 3 - Set 179.

Model 5176CM-E (Chassis TE-320-1) is electrically identical, except for the following changes.

NEW VHF TUNER

A new VHF tuner (part #E-25702-1) is used in chassis TE-320-1. A schematic (Fig. #4) and alignment procedure are given in this bulletin.

COMPONENT CHANGE

R74 is increased from 6.8KΩ to 27KΩ.

R85 is increased from 22KΩ to 47KΩ.

R98 is increased from 6.8KΩ to 12KΩ.

R76 is connected to the -12V line.

LOCAL-DISTANCE SWITCH CHANGED

A partial schematic showing the new circuit employing the local-distance switch is shown in Fig. 2.

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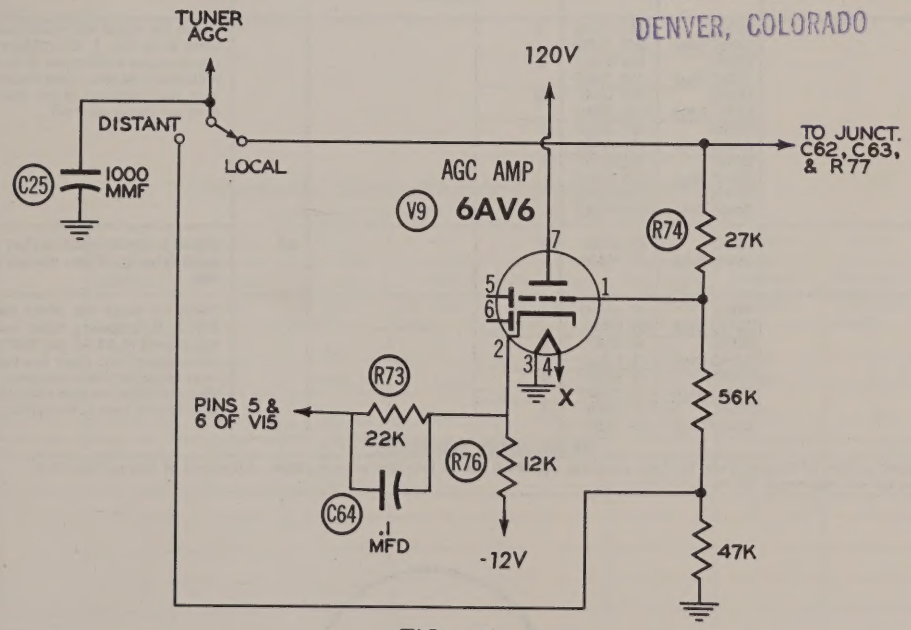

FIG. 2

ARVIN MODEL 5176CM-E (Ch. TE-320-1)

PRODUCTION CHANGES
BULLETIN 126

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VERTICAL OUTPUT CIRCUIT REVISED

A 220KΩ resistor is connected in parallel with C4A. C4A is disconnected from ground and connected in series with another 10MFD, 450V electrolytic, which is shunted by a 220KΩ resistor and connected to ground.

The two resistors connected across the vertical coils of the deflection yoke (T5) are decreased from 2.2KΩ to 560Ω.

A new vertical output transformer (part #C24990) is used in this chassis. The replacements for this transformer are listed below:

HALLDORSON	MERIT	RCA	RAM	STANCOR	THORDARSON	TRIAD
Z1806	A-3039	226T1	V312	A-8141	26S54	A-104X

NEW HORIZONTAL OUTPUT TRANSFORMER

The horizontal output circuit has been changed to accommodate an auto type transformer (part #E24989). A partial schematic showing the new circuit is given in Fig. 3. Replacement transformers and correct terminal connection data are given in this bulletin.

HALLDORSON	MERIT	RCA	RAM	STANCOR	THORDARSON	TRIAD
FB411 *	HVO-9 *	225T1 *	X080 *	A-8252 *	FLY-14 *	D-19*

In conjunction with the new flyback the width coil has been changed to part #C24991. The RCA 214R1 will replace this new width coil.

OSCILLATOR ALIGNMENT

Connect the negative lead of a 3.5 volt bias supply to the IF AGC line.
Connect the positive lead to chassis.
Remove the AGC keying tube from its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 18KΩ to detector output. Low side to chassis.	A1	Adjust to place sound marker in trap notch (Fig. 1). Video marker should be at 50%.
2.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for sound and video marker placement as in Fig. 1. If necessary, make compromise adjustment of A1 for any individual channel, then recheck all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
3.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A2	Adjust to place sound marker in trap notch (Fig. 1). Video marker should be at 50%.
4.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for sound and video marker as in Fig. 1. If necessary make compromise adjustment of A2 for any individual channel, then recheck all other low band channels to see that they have not been seriously affected. Remove bias battery and replace AGC keying tube in its socket.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

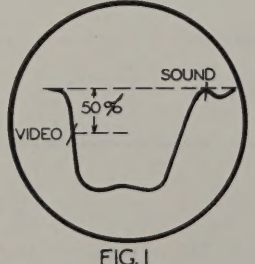

FIG. 1

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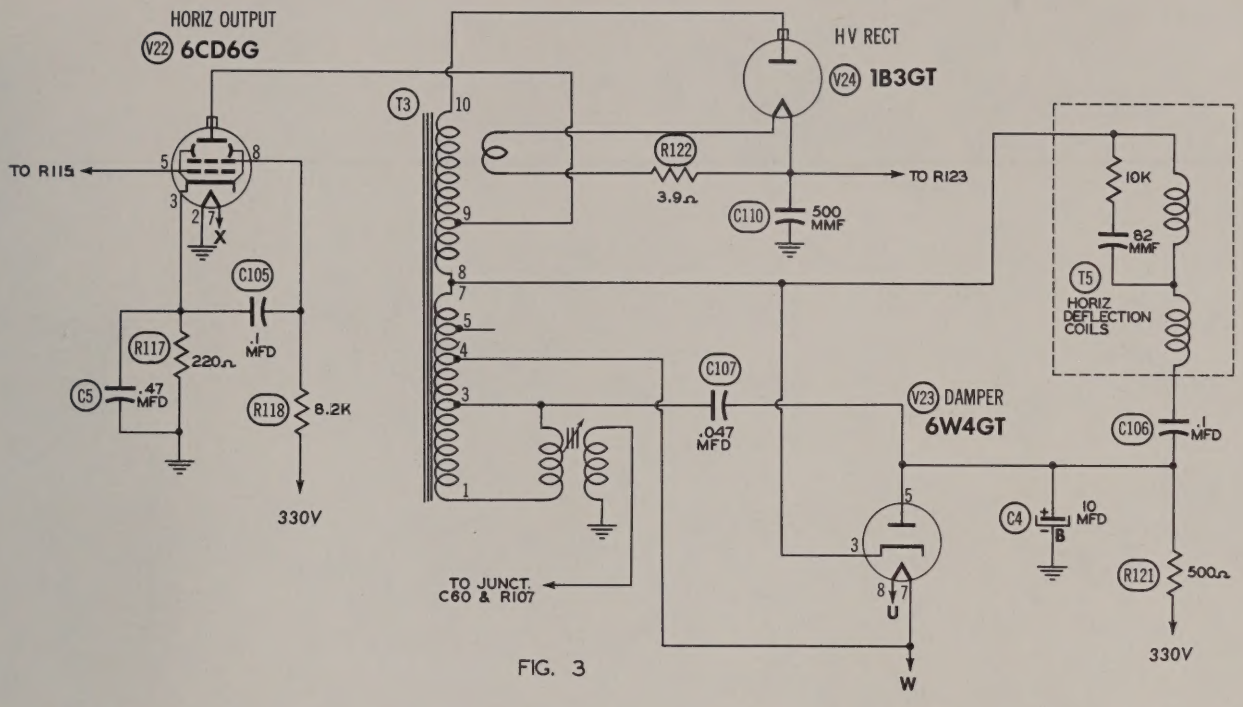


FIG. 3

***HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA**

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	10	1B3 Plate Lead	1B3 Plate Lead	1B3 Plate Lead	1B3 Plate Lead	1B3 Plate Lead	1B3 Plate Lead	1B3 Plate Lead
	9	9	9	9	9	9	9	9
	8 & 7	8 or 7	8 or 7	8 & 7	8 & 7	8 & 7	8 & 7	8 & 7
	5	NC	NC	NC	NC	NC	NC	NC
	4	4 or T	4 or T	4	4 or T	4	4 or T	4 or T
	3	3	3	3	3	3	3	3
	1	1	1	1	1	1	1	1
Connect Width Coil Across →	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1
Special Notes →								

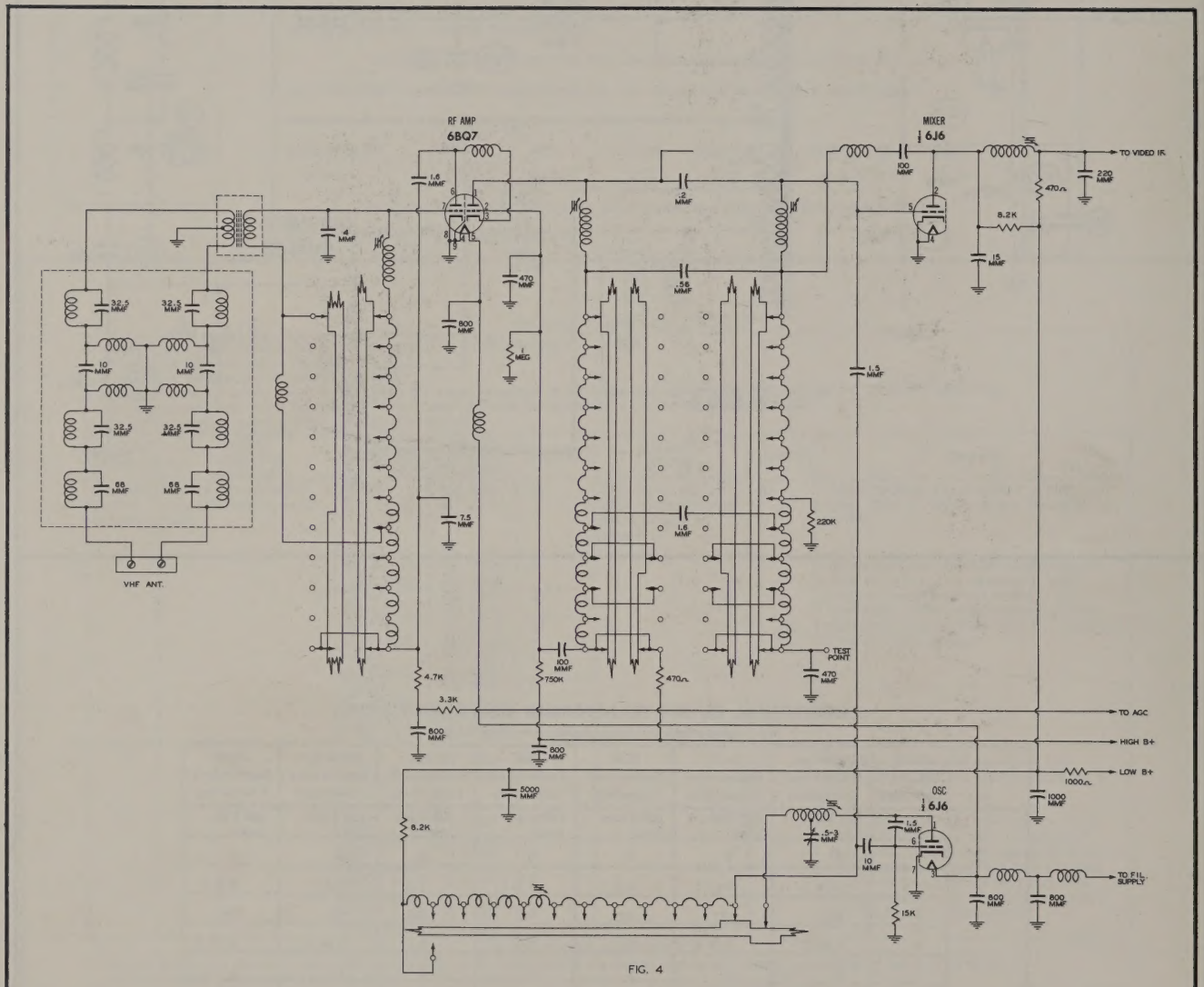

RF AMP
6BQ7
MIXER
½ 6J6
OSC
½ 6J6
TO VIDEO IF
TO AGC
HIGH B+
LOW B+
TO FIL. SUPPLY
TEST POINT
VHF ANT.
1.6 MMF
.4 MMF
.2 MMF
.58 MMF
1.5 MMF
100 MMF
220 MMF
470Ω
8.2K
15 MMF
470 MMF
800 MMF
1 MEG
7.5 MMF
220K
1.6 MMF
100 MMF 750K
470Ω
4.7K
3.3K
800 MMF
800 MMF
5000 MMF
8.2K
1.5 MMF
.5-3 MMF
10 MMF
15K
800 MMF
800 MMF
1000Ω
1000 MMF
32.5 MMF
32.5 MMF
10 MMF
10 MMF
32.5 MMF
32.5 MMF
66 MMF
66 MMF

FIG. 4

PHOTOFACT* Folder

*TRADE MARK

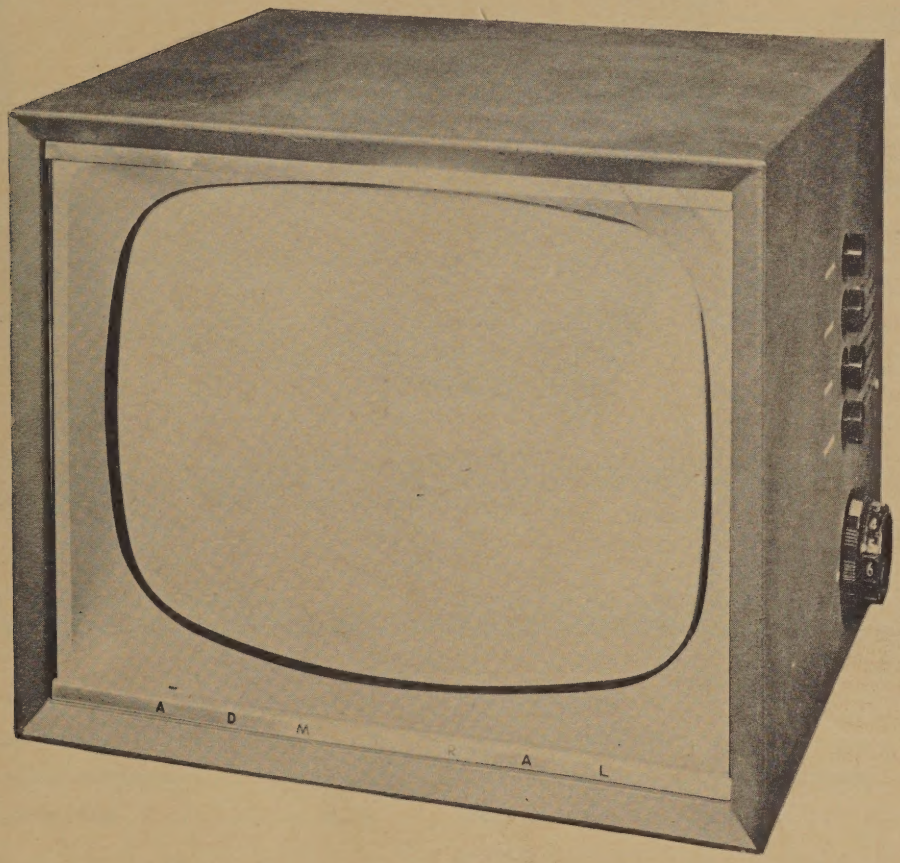
RETMA MEMBER

ADMIRAL MODELS T1801, N, T1802, N, T1806, N, T1807, N (Ch. 17XP3)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL T1802N

ADMIRAL MODELS T1801, N, T1802, N, T1806, N, T1807, N (Ch. 17XP3)

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DATE 7-55 SET 284 FOLDER 2

PHOTOFACT* Folder
*TRADE MARK

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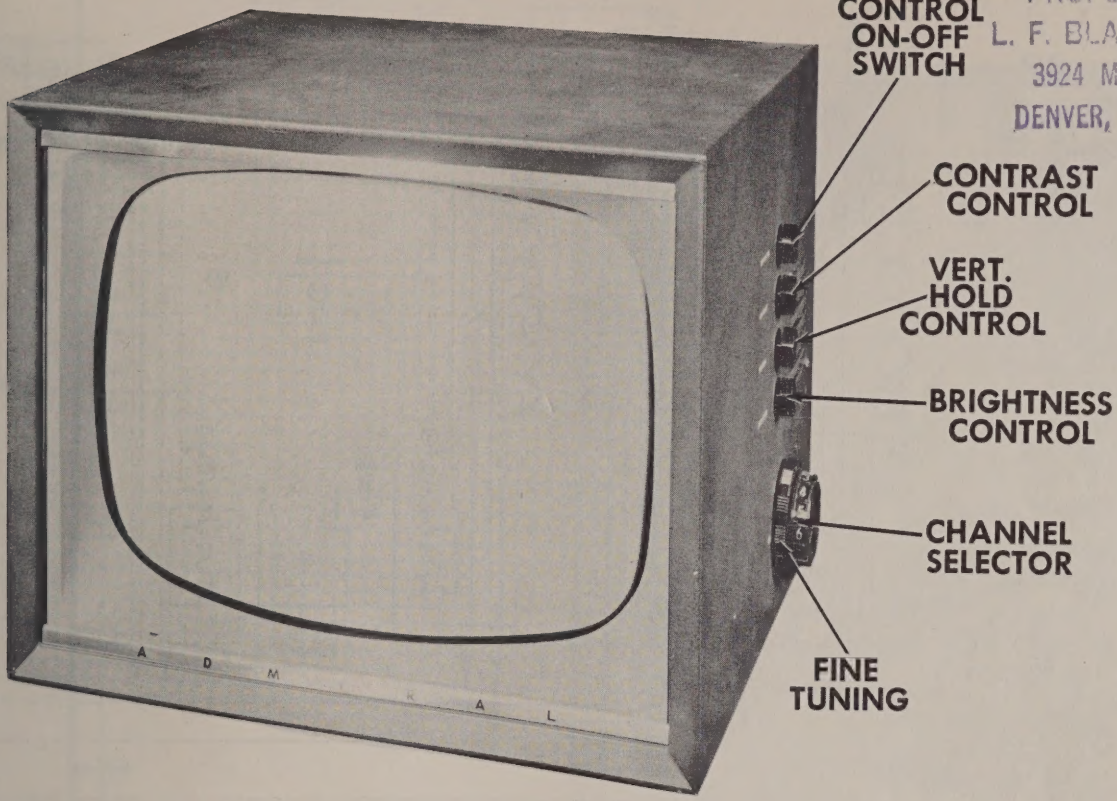

ADMIRAL MODEL T1802N

TRADE NAME	Admiral Models T1801, T1801N, T1802, T1802N, T1806, T1806N, T1807, T1807N (Ch. 17XP3)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING 1.24 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)

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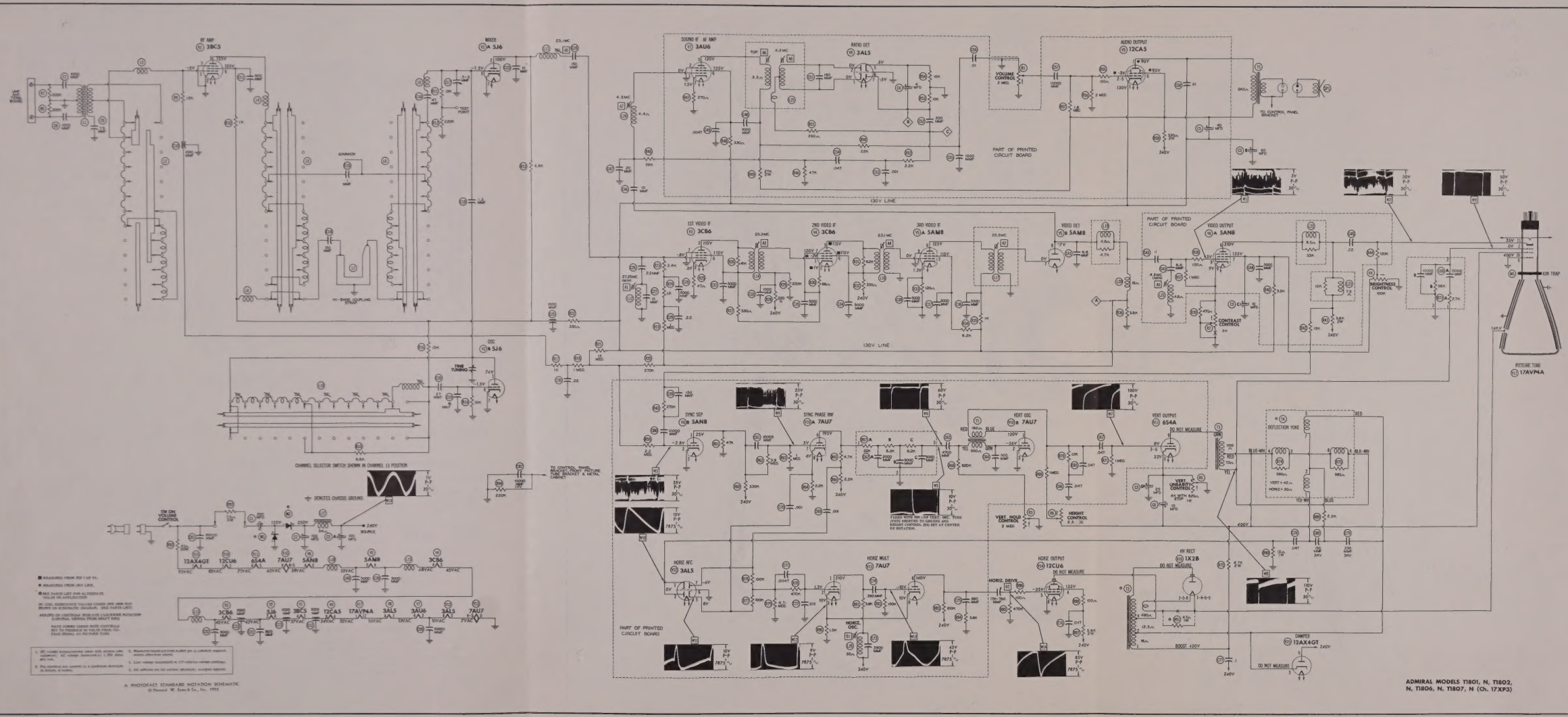

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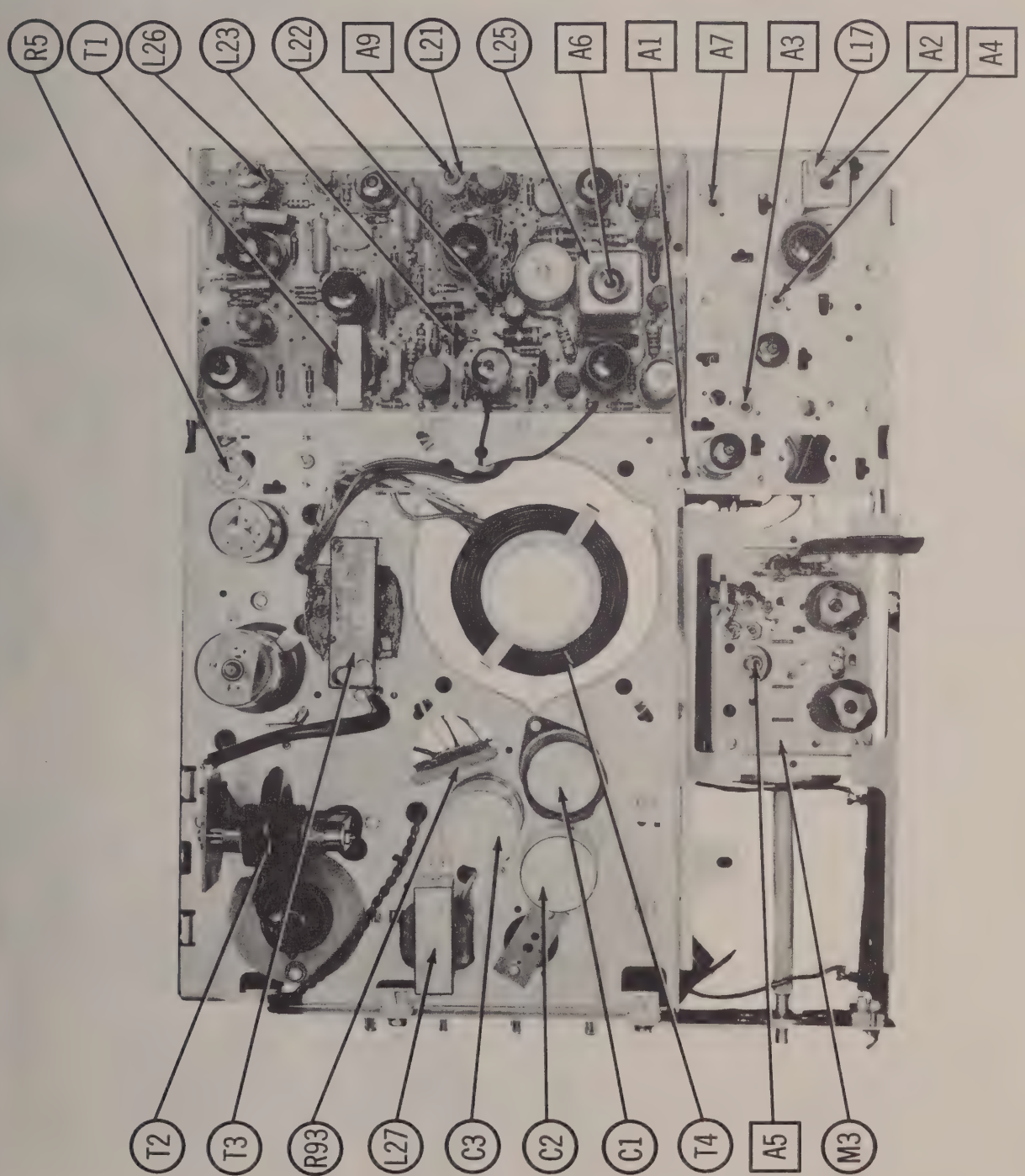

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CHASSIS TOP VIEW

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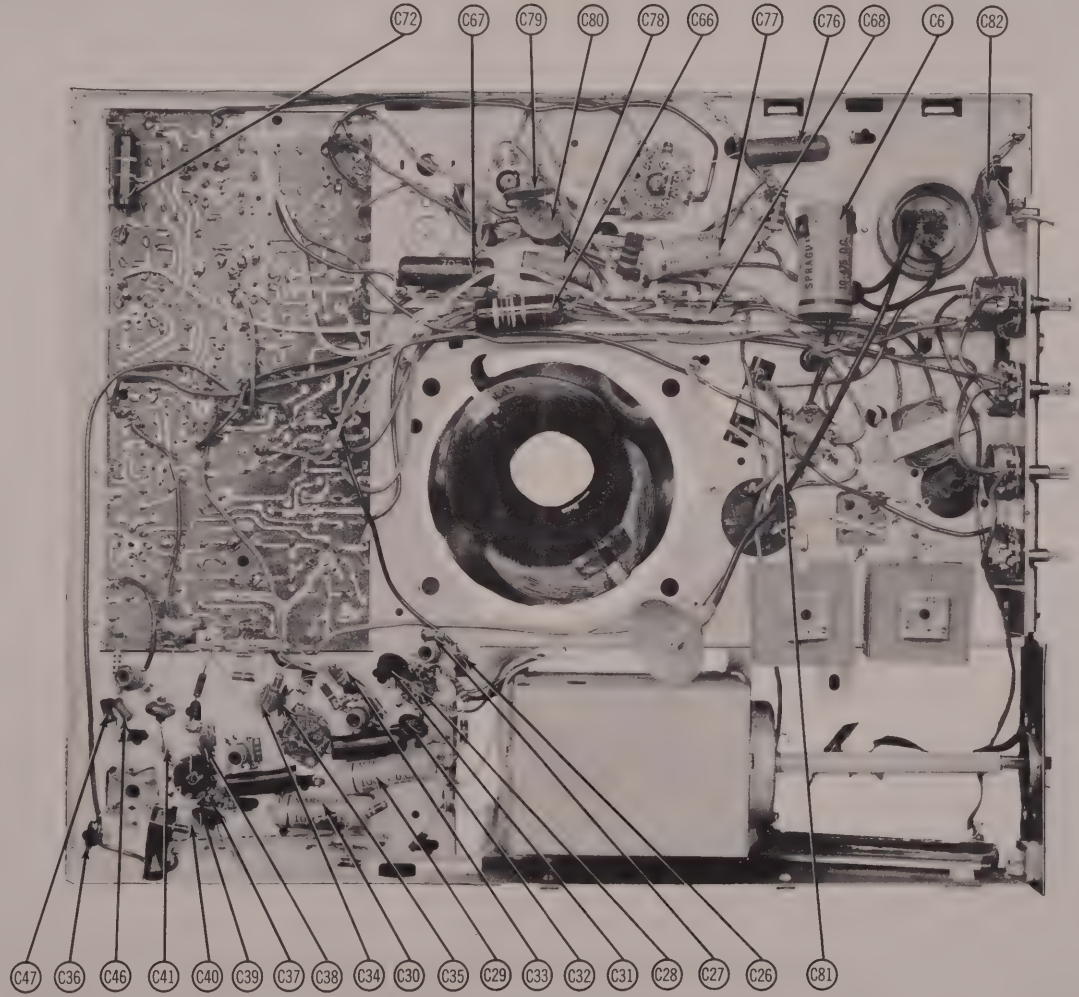

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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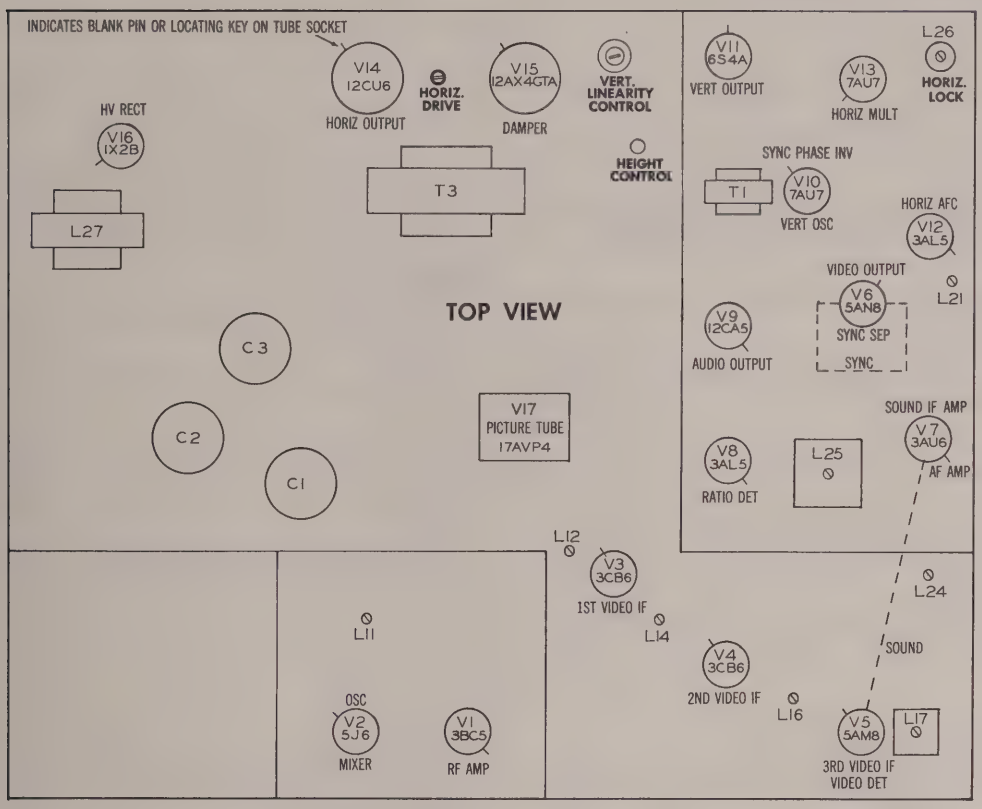
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

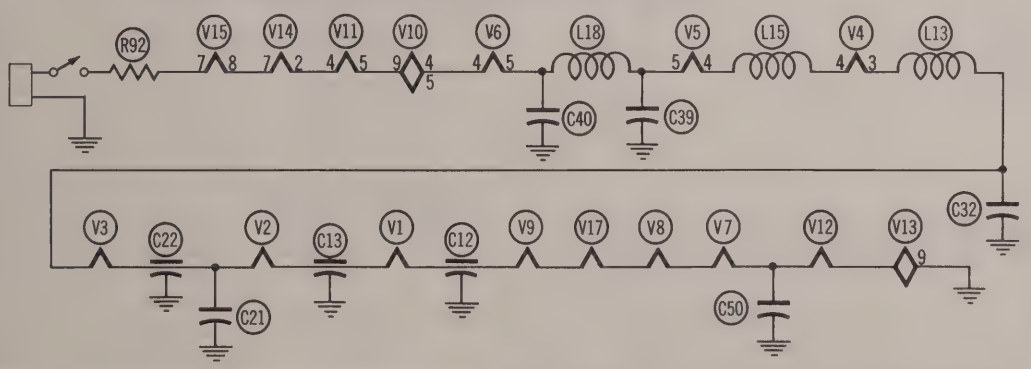
POWER SUPPLY FAILURE
No raster, no sound -Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V17
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V10
No horiz. sync - V10, V12, V13
No vert. or horiz. sync - V6, V10

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V17
No vertical deflection - V10, V11
Poor vert. linearity or foldover - V10, V11
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, M1, M2
Vert. off freq. - V10
Horiz. off freq. - V10, V12, V13

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series may cause the set to be inoperative. (See circuit below.)



TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V14 and V15. Check M1 and M2. Check adjustment B2. Check R92, R93, R87, C74, T2, T4A and other associated components.

DRIVE LINES

Check by substitution V14 and V15. Check adjustment B2. Check T2, T4A, R87 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V14 and V15. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V13, V14 and V15. Check C72 for open. Check L26, C73, C71, R78, R81 and other associated components.

XMAS TREE EFFECT

Check by substitution V13, V14 and V15. Check T2 and T4 for internal arcing. Check L26, C73, C69, C74, C78, R90, R80, R83 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V10 and V11. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R72, C6, C3D and other associated components.	Check T1, C64, C67, R69, R6, R68 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V10 and V11. Check height and vertical linearity controls for proper operation. Check R69, T3 and other associated components.

COMPRESSED AT BOTTOM

Check by substitution V10 and V11. Check R69, R72, R6, C67, T1 and other associated components.

COMPRESSED AT TOP

Check by substitution V10 and V11. Check C3D, T3, T4B, R5 and other associated components.

FOLDS

Check by substitution V10 and V11. Check C66, C65, C67, R70 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V6 and V10. Check C59, C60, C61, R60, R61, R65 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V10. Check vertical integrator network. Check T1, C64, C63, R68, R3 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V12 and V13. Check C69, C70, C71, C73, L26, R81, R78 and other associated components.

HORIZONTAL BENDING

Check by substitution V6, V10, V12 and V13. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V6. Check R41, R40, C42, C45, C3C and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A9. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check contrast control. Check L22, L23, C42, C45, R41 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check C42, C45, L19 and other associated components.

SMEAR

Substitute V6. Check L19, L20, L22, L23, C42, C45 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8 and V9. Check stages V9 using audio signal generator. Apply audio signal across R1.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C56, C57, C58, C3B, R58, R57, T5, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A8 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check all tubes. These tubes are connected in series. Check R92. Check AC interlock assembly. Check switch on volume control. If filaments light, check M1, M2, C1 and R93. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check M1, M2 and R93. Check B+ filter and decoupling network.

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TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V12, V13, V14, V15 and V16. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C78, C79, C80, C76, C77, R87 and other associated components.	Check L26, C73, C74, C75, R80, R81, R83 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V14 and V15. Check M1 and M2. Check R93, R87, C1, T2, T4A and other associated components. Check adjustment B2.

BLOOMING

Check by substitution V14, V15 and V16. Check M1 and M2. Check R93, R87, T2 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

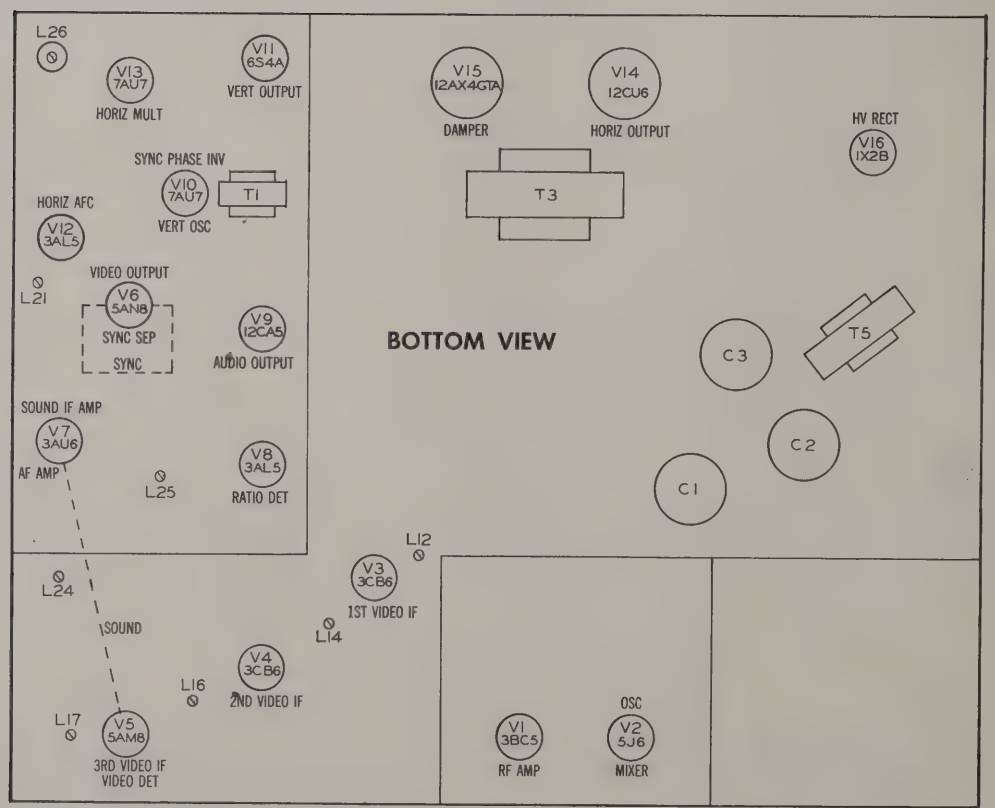
Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

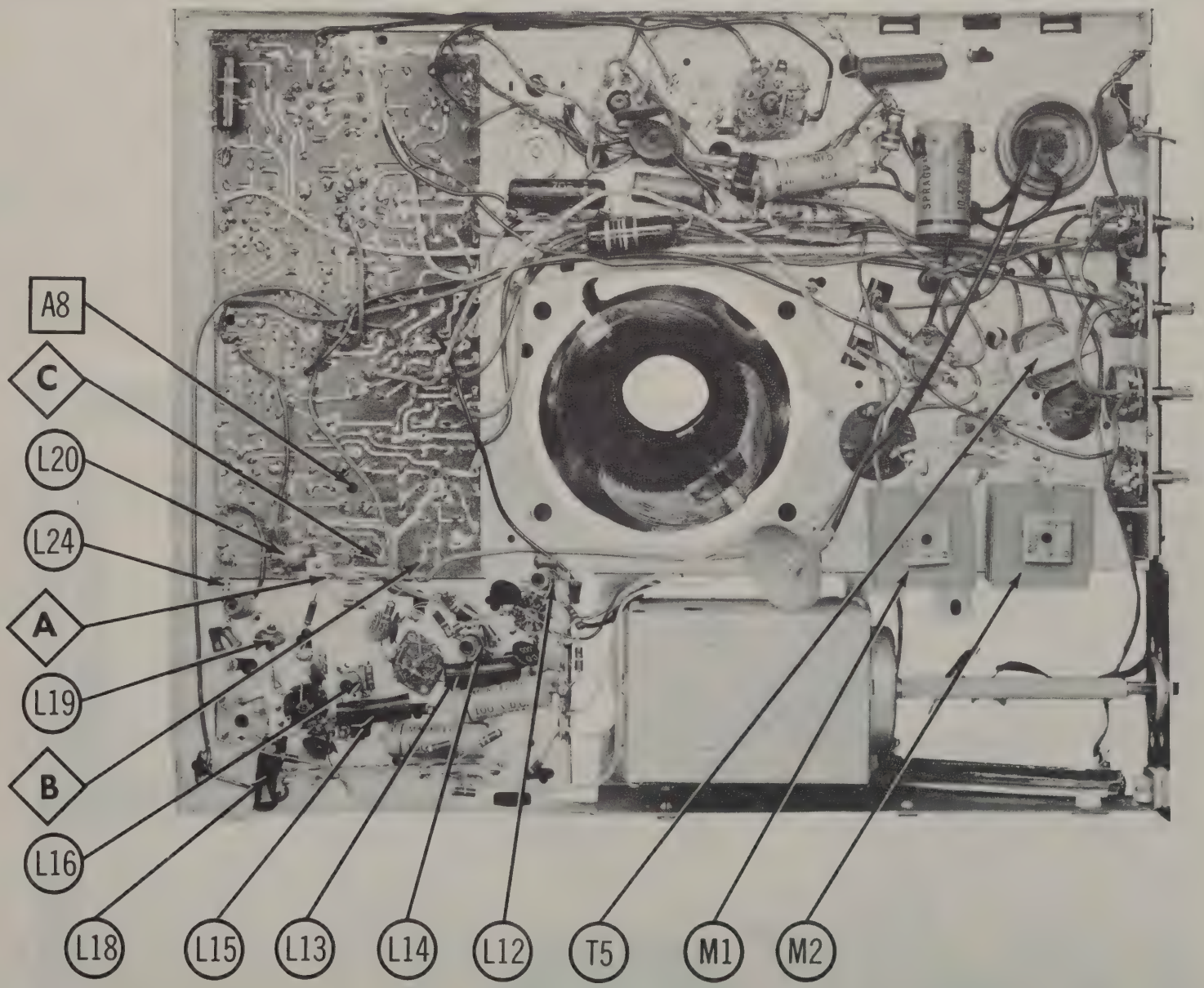
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	3BC5	1.3Meg	0Ω	7Ω	8Ω	■330Ω	■1.3KΩ	0Ω		
V 2	5J6	■15KΩ	■6.8KΩ	10Ω	8Ω	235KΩ	10KΩ	0Ω		
V 3	3CB6	1Meg	47Ω	10Ω	11Ω	▲330Ω	▲330Ω	0Ω		
V 4	3CB6	120KΩ	▲68Ω	11Ω	12Ω	†400Ω	†400Ω	INF		
V 5	5AM8	120Ω	.4Ω	■8.2KΩ	12Ω	13Ω	■1KΩ	.2Ω	5.6KΩ	0Ω
V 6	5AN8	†100KΩ	2.4Meg	0Ω	14Ω	13Ω	†5.6KΩ	■3.9KΩ	1Meg	150Ω
V 7	3AU6	90KΩ	0Ω	1.8Ω	2.8Ω	†27KΩ	■330Ω	270Ω		
V 8	3AL5	INF	INF	2.8Ω	3.7Ω	10KΩ	0Ω	10KΩ		
V 9	12CA5	80KΩ	1Meg	7Ω	5Ω	1Meg	†400Ω	†650Ω		
V 10	7AU7	▲2.3Meg	1.8Meg	0Ω	14Ω	14Ω	†7KΩ	850KΩ	2.2KΩ	15Ω
V 11	6S4A	NC	1.7KΩ	1Meg	16Ω	15Ω	1Meg	NC	NC	▲5.8KΩ
V 12	3AL5	15Ω	15Ω	.9Ω	1.8Ω	4.8Meg	0Ω	4.8Meg		
V 13	7AU7	†5.7KΩ	5.2Meg	1.5KΩ	.9Ω	.9Ω	†100KΩ	150KΩ	1.5KΩ	0Ω
V 14	12CU6	TP	16Ω	TP	†5.8KΩ	470KΩ	NC	19Ω	0Ω	TOP CAP ▲13.5Ω
V 15	12AX4GTA	TP	TP	250KΩ	NC	†55Ω	NC	21Ω	19Ω	
V 16	1X2B		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲50.5Ω
V 17	17AVP4	5Ω	56KΩ	PIN 6 0Ω	PIN 10 4.7KΩ	PIN 11 ■180KΩ	PIN 12 3.7Ω			

■ MEASURED FROM 130V LINE
▲ MEASURED FROM PIN 7 OF V4
† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 3 OF V15.
TP - TIE POINT
NC - NO CONNECTION

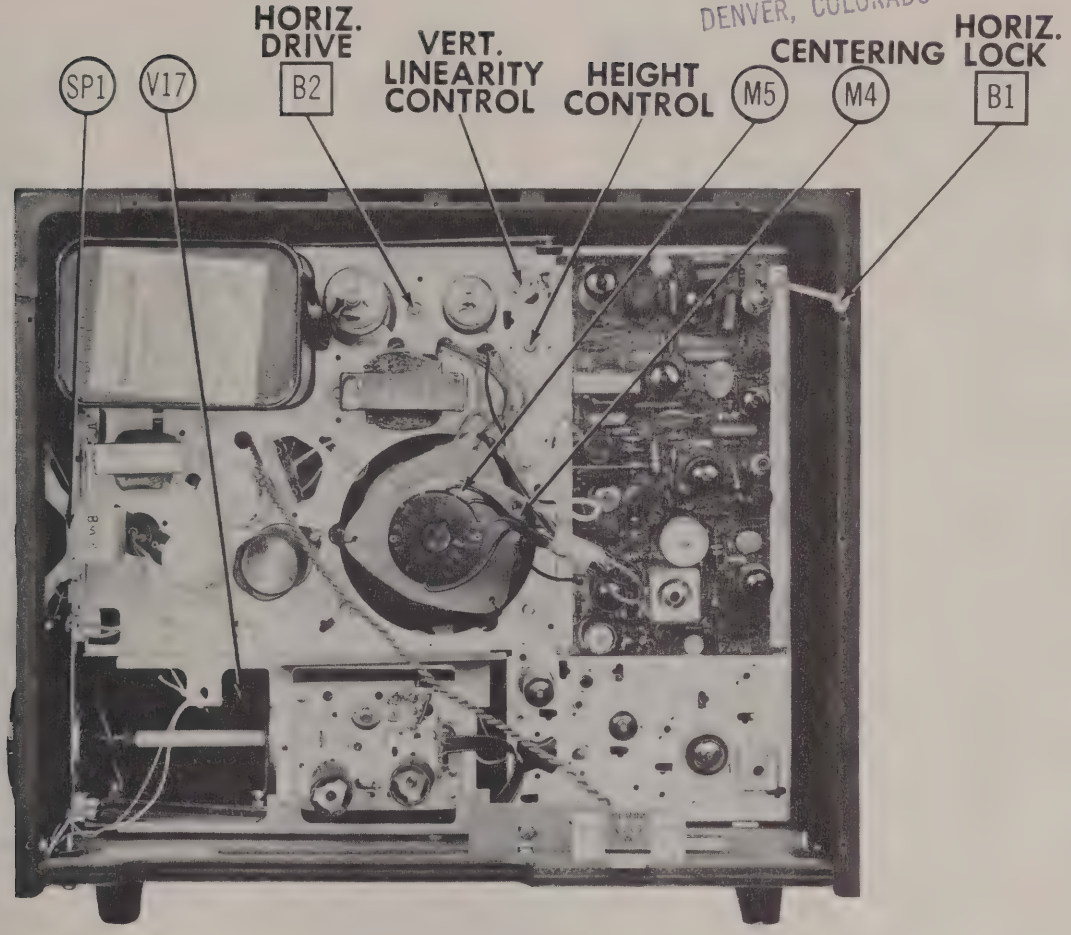


TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

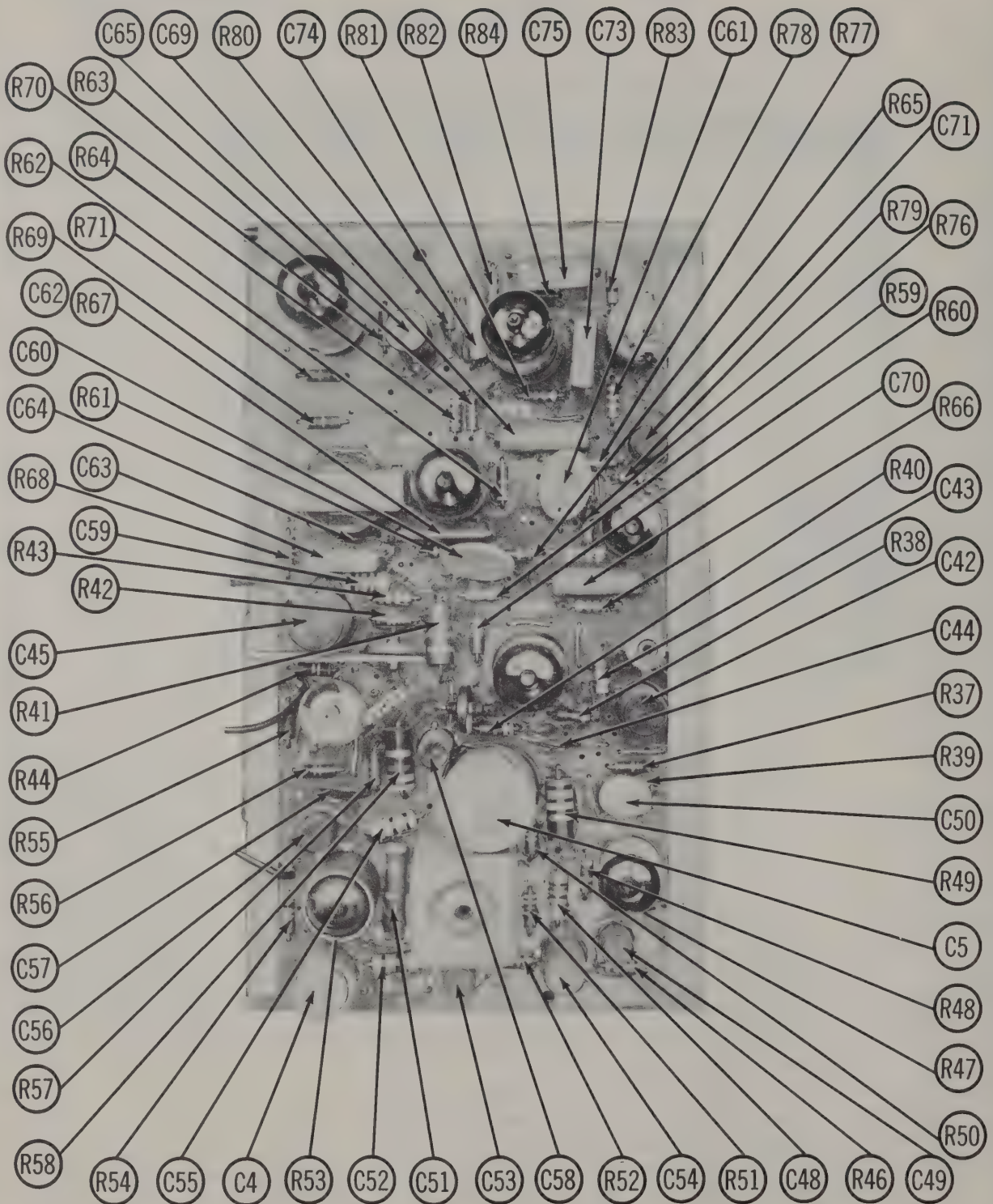
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



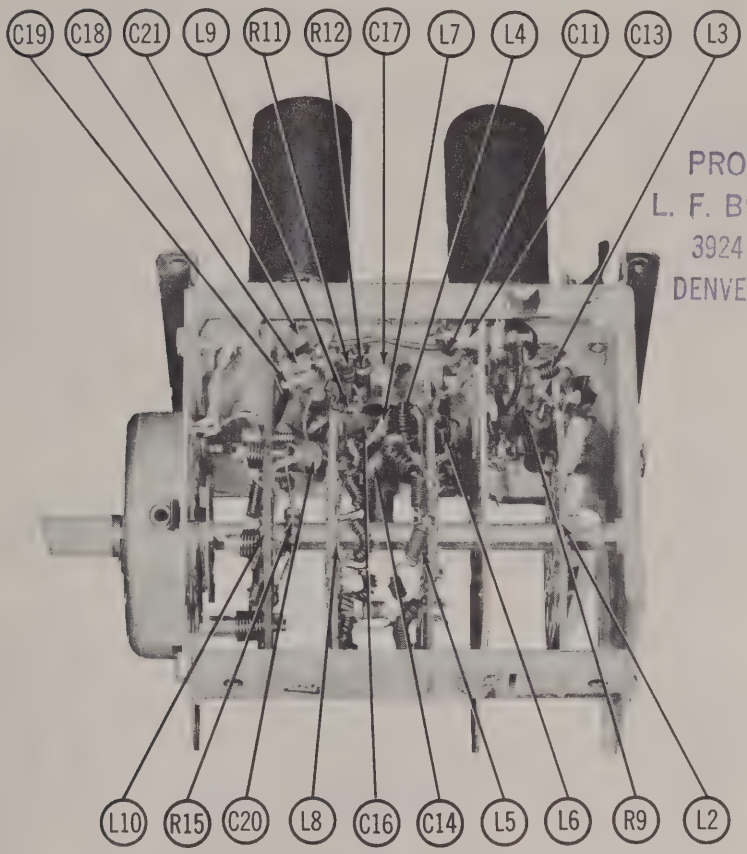
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably a test pattern.
2. Set the brightness and contrast control for normal picture.
3. Turn the horizontal oscillator slug (B1) clockwise until the picture loses sync. It may be necessary to switch off channel momentarily for picture to lose sync.
4. Turn B1 slowly counter clockwise until picture just falls into sync.
5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive trimmer (B2) until white lines disappear.
6. If in step 5 the horizontal drive was adjusted, tune in a station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back.

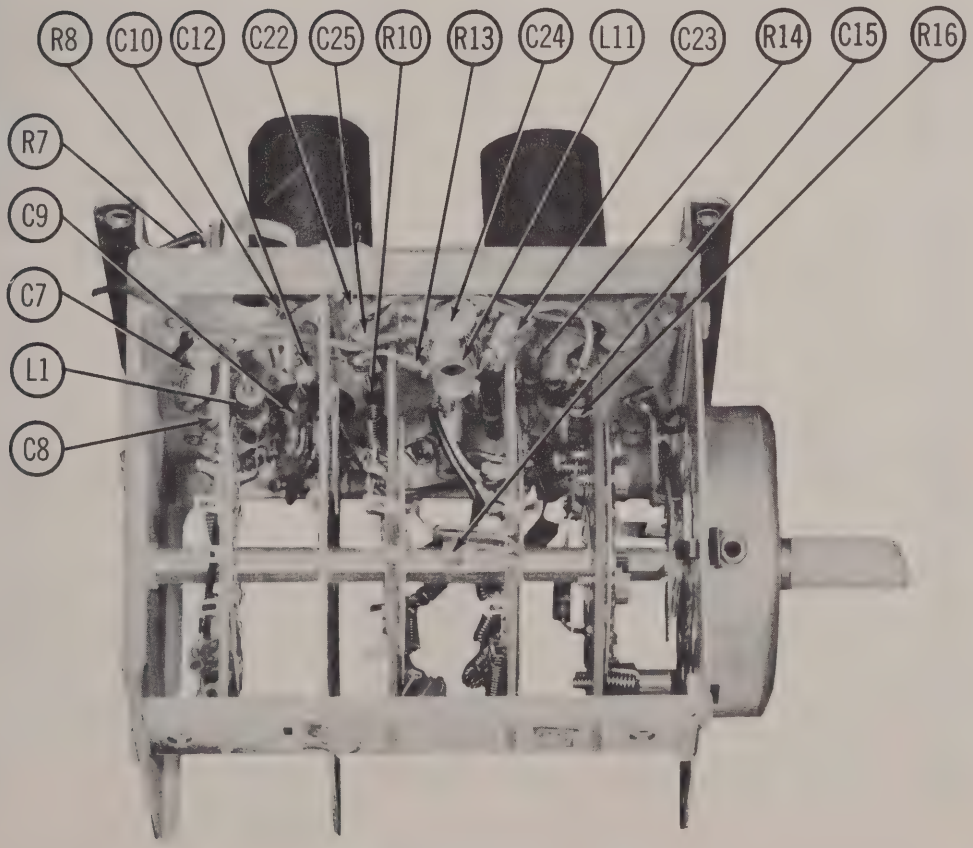


PRINTED CIRCUIT SUB-CHASSIS



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PROPERTY OF
L. F. BLANKENSHIP
[illegible] MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	3BC5	3BC5	TBD	
V2	Osc.-Mixer	5J6	5J6	TBF	
V3	1st. Video IF Amp.	3CB6	3CB6	7CM	
V4	2nd Video IF Amp.	3CB6	3CB6	7CM	
V5	3rd Video IF Amp: Video Det.	5AM8	5AM8	9CY	
V6	Video Output-Sync Sep.	5AN8	5AN8	8DA	
V7	Sound IF Amp.-AF Amp.	3AU6	3AU6	7BK	
V8	Ratio Det.	3AL5	3AL5	6BT	
V9	Audio Output	12CA5	12CA5		
V10	Sync Phase Inv.-Vert. Osc.	7AU7	7AU7	9A	
V11	Vert. Output	6B4A	6B4A	9AC	
V12	Horiz. AFC	3AL5	3AL5	6BT	
V13	Horiz. Mult	7AU7	7AU7	9A	
V14	Horiz. Output	12CU8	12CU8	6AM	
V15	Damper	12AX4GTA	12AX4GTA	4CG	
V16	HV Rectifier	1X2B	1X2B	9T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ADMIRAL Part No.	CBS-HYTRON Part No.	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	WESTINGHOUSE Part No.	RETMA BASE TYPE	NOTES
V17	17AVP4A ①	17AVP4		17AVP4A ② 17AVP4		12L 12L	① Aluminized ② Silver Screen

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL Part No.	CENTRALAB Part No.	ERIE Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	NOTES
C1	200	150	67D15-118				FP118	TM-200-150	E-110
C2	100	300	67D15-119				FP150	TM-100-450	E-190
C3A	▲100	300	67D15-117				FP420.33	TM-4134	Q-154
B	●80	300					2C59		
C	▲10	150							
D	80	50							
C4	4	30	67B27-8				TC30	TD-4-50	MMT-0505
C5	40	300	67A4-31				TC50	TD-40-250	MT-2540
C6	10	475	67A4-23				TC25	TD-10-475	MT-4710
C7	1000		67C6-41	DD-102	501-001		DC-531		
C8	1000		67C6-41	DD-102	501-001		DC-531		
C9	7.5		94D77-78						
C10	1000		94D77-88						
C11	900		94D77-84		501-001		DC-531		
C12	1000		94D77-88	DD-801					
C13	1000		94D77-88						
C14	150		94D77-81	D6-181	511-151		UC-5315		
C15	1		94D77-86	TC5-1	MP0A-010		UC-5447		
C16	47		94D77-77	D6-470			CT95A		
C17	.5-3		94D77-82	33S-3	311S-01-GR5				
C18	1.3		94D77-87						
C19	93								
C20	27		94D77-79						
C21	900		94D77-84	DD-801	501-001		DC-531		
C22	1000		94D77-88						
C23	10		94D77-76						
C24	150		94D77-81	D6-181	511-151		UC-5315		
C25	1000		94D77-88						
C26	2.3		67C6-86	TC5-2.3	MP0A-2R3		ZT-5523		
C27	15		67C6-90	TC5-15	MP0K-150		ZT-5415		
C28	5000		67C6-10	DD-502	511-008		DC-535		C-1250
C29	.32	100	64D98-37				PT4032	IMP2-P32	3302032
C30	.32	100	64D98-37				PT4032	IMP2-P32	3302032
C31	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C32	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C33	1000		67C6-15	DD-102	501-001		DC-531		K-1210
C34	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C35	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C36	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C37	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C38	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C39	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C40	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C41	6.8		64D98-35				ZT-5568		
C42	5000		67C6-15	DD-502	511-005		DC-535		C-1250
C43	.33	400	64D98-38						380008
C44	10		67C6-44	TC5-10	MP0K-100		ZT-541		
C45	50		67C6-51	TC5-50	MP0K-500		ZT-543		
C46	1000		94D77-88	D6-102	GP2L-103		UC-531		K-1210
C47	.0047	400	64D98-38						380006
C48	10000		67C6-41	DD-103	511-01		DC-511		
C49	10000		67C6-59						
C50	180		67C39-8	D6-501	GP2K-501		UC-535		K-1350
C51	500		67C39-5						380005
C52	.001	400	64D98-43						380003
C53	.047	300	64D98-55						380008
C54	1000		67C39-1	D6-102	GP2L-103		UC-531		K-1210
C55	.01	400	64D98-36						380007
C56	10000		67C10-3	DD-103	511-01		DC-511	IMP6-01	330611
C57	10000		67C6-59						380009
C58	.01	600	64D98-58						
C59	150		67C39-6	D6-151	GP2K-151		UC-5315		K-1315
C60	10000		67C10-41	DD-103	511-01		DC-511	IMP6-01	330611
C61	10000		67C10-41	DD-103	511-01		DC-511	IMP6-01	330611

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL Part No.	CENTRALAB Part No.	ERIE Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	NOTES
C62A	2000						DC-533		
B	3000		●83C9-1		▲1405-01		DC-535		
C	5000						DC-535		
C63	4700	500	65B21-472				MC3465	CR-1347	
C64	500		65C10-10	D6-501	511-501		UC-535	K-1350	
C65	.047	400	64B15-33					380001	
C66	.047	600	64B43-14	DF-503			PT8147	IMP6-847	3306147
C67	.047	600	64B9-9	DF-503			PT8147	IMP6-847	3306147
C68A	10000		▲63C6-13	DD-103	511-01		DC-511		
B	10000			DD-103	511-01		DC-511		
C69	.001	400	64B2-34	D6-102	GP2L-102		PT831	IMP6-D1	330631
C70	.001	400	64B2-34	D6-102	GP2L-102		PT831	IMP6-D1	330631
C71	.0047	400	64B15-38						380006
C72	.015	400	64B9-12				PT8115	IMP6-815	3306115
C73	3900	500	65B21-392				MC3463	CR-1339	
C74	390	500	65B21-391				MC3343	KR-1339	
C75	680	500	65B21-681					KR-1345	
C76	.047	400	64B9-9	DF-503			PT8147	IMP4-847	3304147
C77	.1	600	64B9-7	DF-104			PT801	IMP6-P1	330601
C78	.047	600	64B9-9	DF-503			PT8147	IMP6-847	3306147
C79	230	1000	65C10-59						
C80	150	3000	65C10-58	DD30-151	3KV-151				
C81	10000			DD-103	511-01		DC-511		
C82	10000	1000	65C10-65						

● Items C68A, C69B, C69C, R67A, R67B, and R67C are combined in one unit.
† Items C68A, C68B, R73A and R73B are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	2Meg	½	75C3-23	Q13-139	A47-2Meg-Z	AB-76	U-56	Volume
B	Shaft		Not Req.	Not Req.	KSB-3	AE-6	Not Req.	Attach to R1A
C	Switch		Not Req.	78-1	SWS-12	KB-1	UB-36	Attach to R1A
R2A	3000Ω	½	75C15-53	Q17-113		AB-705		Contrast
B	Shaft		Not Req.	Not Req.		AK-6		Attach to R2A
R3A	2Meg	½	75C30-36	Q11-139	A47-2Meg-S	AB-75	U-56	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSB-3	AE-6	Not Req.	Attach to R3A
R4A	100Ko	½	75C30-25	Q11-138	A47-100K-S	AB-60	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KSB-3	AE-6	Not Req.	Attach to R4A
R5	4000Ω	1	75B37-1					Vert. Linearity (Wire wound)
	with 820Ω step							
R6A	2.5Meg	½	75C30-1	Q11-139	A47-2.5Meg-S	BX2-83	SU-355	Height
B	Shaft		Not Req.	Not Req.	KSB-3	Not Req.	Not Req.	Attach to R6A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL Part No.	IRC Part No.	NOTES
R7	220KΩ	½	60B8-224	BTS-220K	
R8	330Ω	½	60B8-334	BTS-330K	
R9	12KΩ	½	60B8-123	BTS-12K	
R10	100Ω	½	60B8-103	BTS-1000	
R11	15KΩ	½	60B8-153	BTS-15K	
R12	220KΩ	½	60B8-224	BTS-220K	
R13	680Ω	½	60B8-681	BTS-680	
R14	10KΩ	½	60B8-103	BTS-10K	
R15	680Ω	½	60B8-681	BTS-680	
R16	15KΩ	½	60B8-153	BTS-15K	
R17	1000Ω	½	60B8-102	BTS-1000	
R18	1Meg	½	60B8-105	BTS-1Meg	
R19	1Meg	½		BTS-1Meg	
R20	3.7KΩ	½		BTS-3.7K	
R21	15Meg	½	60B8-156	BTS-15Meg	
R22	330Ω	½	60B8-331	BTS-330	
R23	2400Ω 5%	½	60B7-242	BTS-2400 5%	
R24	1000Ω	½	60B8-102	BTS-1000	
R25	47Ω	½	60B8-47	BTS-47	
R26	165Ω 5%	½	60B7-165	BTS-165K 5%	
R27	330Ω	½	60B8-331	BTS-330	
R28	220KΩ	½	60B8-224	BTS-220K	
R29	220KΩ	½	60B8-224	BTS-220K	
R30	68Ω	½	60B8-68	BTS-68	
R31	6200Ω 5%	½	60B7-622	BTS-6200 5%	
R32	330Ω	½	60B8-331	BTS-330	
R33	120Ω	½	60B8-121	BTS-120	
R34	8200Ω	½	60B8-822	BTS-8200	
R35	1000Ω	½	60B8-102	BTS-1000	
R36	5600Ω	½	60B8-562	BTS-5600	
R37	1Meg	½	60B8-105	BTS-1Meg	
R38	100Ω	½	60B8-101	BTS-100	
R39	470Ω	½	60B8-471	BTS-470	
R40	3900Ω	½		BTS-3900	
R41	5600Ω	2	60B30-562	BTS-5600	
R42	15KΩ	½	60B8-153	BTS-15K	
R43	270KΩ	½	60B8-274	BTS-270K	
R44	120KΩ	½	60B8-134	BTS-130K	
R45	39KΩ	½	60B8-393	BTS-39K	
R46	47KΩ	½	60B8-473	BTS-47K	
R47	270Ω	½	60B8-271	BTS-270	
R48	330Ω	½	60B8-331	BTS-330	
R49	27KΩ	2	60B20-273	BTS-27K	
R50	22KΩ	½		BTS-22K	
R51	390Ω	½	60B8-391	BTS-390	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL Part No.	IRC Part No.	NOTES
R52	220Ω	½	60B8-221	BTS-2200	
R53	10KΩ	½	60B8-103	BTS-10K	
R54	10KΩ	½	60B8-103	BTS-10K	
R55	150Ω	½	60B8-151	BTS-150	
R56	2Meg 5%	½	60B7-205	BTS-2Meg 5%	
R57	1.6Meg 5%	½		BTS-1.6Meg 5%	
R58	330Ω	2	60B20-331	BTS-330	
R59	2.2Meg	½	60B8-225	BTS-2.2Meg	
R60	330KΩ	½	60B8-334	BTS-330K	
R61	47KΩ	½	60B8-473	BTS-47K	
R62	3.9Meg	½	60B8-395	BTS-3.9Meg	
R63	1Meg	½	60B8-105	BTS-1Meg	
R64	2200Ω	½	60B8-222	BTS-2200	
R65	4700Ω	½	60B8-472	BTS-4700	
R66	2200Ω	½	60B8-222	BTS-2200	
R67A	33KΩ	½	●83C9-1	BTS-33K	
B	8200Ω	½		BTS-8200	
C	8200Ω	½		BTS-8200	
R68	330KΩ	½	60B8-334	BTS-330K	
R69	1Meg	½	60B8-105	BTS-1Meg	
R70	33KΩ	½	60B8-133	BTS-33K	
R71	1Meg	½	60B8-105	BTS-1Meg	
R72	4700Ω	2	60B20-472	BTS-4700	
R73A	2700Ω	½		BTS-2700	
B	56KΩ	½	▲63C6-13	BTS-56K	
R74	56Ω	½	60B8-561	BTS-560	
R75	560Ω	½	60B8-561	BTS-560	
R76	100KΩ 5%	½	60B7-104	BTS-100K 5%	
R77	100KΩ 5%	½	60B7-104	BTS-100K 5%	
R78	470KΩ	½	60B8-474	BTS-470K	
R79	1.5Meg	½	60B8-475	BTS-4.7Meg	
R80	150Ω	½	60B8-153	BTS-1500	
R81	560Ω	½	60B8-561	BTS-5600	
R82	150KΩ	½	60B8-154	BTS-150K	
R83	100KΩ	½	60B8-104	BTS-100K	
R84	560Ω	½	60B8-561	BTS-5600	
R85	470KΩ	½	60B8-474	BTS-470K	
R86	10Ω	½	60B28-19	BTS-100	
R87	5600Ω	2	60B30-562	BTS-5600	
R88	100Ω	½	60B8-101	BTS-100	
R89	2200Ω	½		BTS-2200	
R90	18Ω	1	60B14-150		
R91	4.7Ω	1	60B28-11		Note 1
R92	47Ω	20	61A3-17		
R93	7.5Ω	5	61A19		
R94	220KΩ	½	60B8-224	BTS-220K	

Note 1: Used with HV transformer 79C80-5 only.
● Items R67A, R67B, R67C, C63A, C63B & C63C are combined in one unit.
† Items R73A, R73B, C68A & C68B are combined in one unit.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: ADMIRAL Part No.	Halldorson Part No.	Merit Part No.	RCA Part No.	Ram Part No.	Stancor TYPE No	Thordarson Part No	Triad Part No
T1	Vert. Osc. Trans.	79B18-7	B6702 ①	A-3003 ①		V405 ①	A-8125 ①		A-97X ①
T2	Horiz. Output Trans.	79C80-4 ② 79C80-5 ③	FD420*				A-8250*		Y-49 ②
T3	Vert. Output Trans.	79B43-4	Z1806	A-3039		V312	A-8141	26S54	A-109X ④
T4A	Yoke(90°) Horiz(15KH)	94C74-6 ⑤	DF901 ⑥ ⑦				DY-15A ⑤		Y-16 ⑥ ⑦
B	Vert(38MH)	94C74-6 ⑤							Y-41-A ⑥ ⑦

① Cut and bend frame to duplicate original, or use original frame.
② Used in chassis stamped "Run 1" only.
③ Used in chassis stamped "Run 2" or higher.
④ Connect as auto transformer.
⑤ Alternate yoke.
⑥ Use original yoke cover and centering device.
⑦ Use original horizontal yoke network.
Includes resistors R74, R75, R89; capacitors C79 and C80.
See instruction sheet packaged with unit for terminal connections.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	5				5		
2	3				4		
1	1				2		

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ADMIRAL Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No	Thordarson Part No	Triad Part No	NOTES
T5	3KΩ	3.3Ω	79C33-11	Z1105	A-3025	A-3332	22S48 ①		① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V C IMP	REPLACEMENT DATA: ADMIRAL Part No.	QUAM Part No.	NOTES
SP1	4"	PM	3.3Ω	78B102-1 78C103-1 ①	4A07	① Alternate EM speaker, includes output trans.

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: ADMIRAL Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L1	Ant. Trans.	.10CT	.1Ω	94D77-100				
L2	Ant. Coils	0Ω		94D77-107				Coil Kit #94D77-97
L3	Ant. Coil	0Ω		94D77-80				Channel 13
L4	RF Coil	0Ω		94D77-82				Channel 13
L5	RF Coils	0Ω		94D77-109				Coil Kit #94D77-98
L6	RF Choke	0Ω		94D77-89				
L7	Hi-Band Coupling Strap	0Ω						
L8	Mixer Grid Coils	0Ω		94D77-105				Coil Kit #94D77-99
L9	Mixer Grid Coil	0Ω		94D77-90				Channel 13
L10	Osc. Coils	0Ω		94D77-106 ●				Osc. Coil-Channel 2 - Part #94D77-92 Osc. Coil-Channel 3 - Part #94D77-93 Osc. Coil-Channel 4 - Part #94D77-94 Osc. Coil-Channel 5 - Part #94D77-95 Osc. Coil-Channel 6 - Part #94D77-96
L11	1st. Video IF	.6Ω		94D77-91				Osc. Coil-Channel 13 - Part #94D77-85 Iron Core Part #94D77-101
L12	2T.35MC Trap	0Ω		72DU1-39	20-1006		6171A	
L13	Fil. Choke	0Ω		73A2-5	19-3001	TV-189	6175	.6 Microhenry
L14	2nd Video IF	.4Ω	.4Ω	72DU1-38	19-3001	TV-102 *	6250	
L15	Fil. Choke	0Ω		73A3-5	19-3001	TV-189	6175	.6 Microhenry
L16	3rd. Video IF	.4Ω	.4Ω	72DU1-32	17-1052	TV-102 *	6250	
L17	4th. Video IF	.5Ω	.3Ω	72DU43-2	17-1001	TV-102 ■	6186 ■	
L18	Fil. Choke	0Ω		73A3-5	19-3001	TV-189	6175	.6 Microhenry
L19	Series Peaking Coil	6.8Ω		73A5-15	19-3180 ▲	TV-184 ▲	6180 ▲	180 Microhenries, wound on 4.7KΩ resistor
L20	Shunt Peaking Coil	16Ω		73A5-7	19-3500	TV-186	6174	500 Microhenries
L21	4.5MC Trap	4.6Ω		72A152				
L22	Series Peaking Coil	8.5Ω		73B5-21	19-3300 ▲	TV-185 ▲	6155 ▲	280 Microhenries wound on 33KΩ resistor
L23	Shunt Peaking Coil	7.5Ω		73B5-22	19-4421	TV-190 †	4648 †	375 Microhenries wound on 10KΩ resistor
L24	Sound IF	4.4Ω		72B99-14	20-1005	TV-181	1470	
L25	Ratio Det.	3.5Ω	.3Ω CT	72C86-4	19-1023 ♦	TV-182 ♦	1468 ♦	Tertiary winding -.75Ω
L26	Horiz. Osc.	50Ω		94C17-4	19-1576	TV-183	6210	

* Enlarge mounting hole.
■ Dehone trap winding.
▲ Parallel with 4.7KΩ resistor.
♦ Parallel with 33KΩ resistor.
† Parallel with 10KΩ resistor.
♦ Remove spade bolts.

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L27	.200A	54Ω	1.3HY	74B18-10	C5040	C-2994		26C41	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	ADMIRAL PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.200A	93A2 93A4-2 ①	1010	RS-250	6S250	5Q1	300	① Alternate selenium rect.
M2	.200A	93A2 93A4-2 ①	1010	RS-250	6S250	5Q1	300	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Tuner	94D85-1	VHF
M4	Centering Device	94A71-1	
M5	Ion Trap	94A15-4	
B2	Trimmer Cap.	66A-30-3	Horiz. Drive (178-780MMF)
	Cabinet	34E85-1	Model T1801
	Cabinet	34E85-2	Model T1802
	Cabinet	35E323-2	Model T1806
	Cabinet	35E323-3	Model T1807
	Knob	33D144-1	Channel Sel.; Models T1801, T1807
	Knob	33D144-6	Channel Sel.; Models T1802, T1806
	Knob	33D144-2	Fine Tuning; Models T1801, T1807
	Knob	33D144-7	Fine Tuning; Models T1802, T1806
	Knob	33D143-1	On-Off-Volume - Model T1801
	Knob	33D143-5	On-Off-Volume - Model T1802
	Knob	33D143-3	On-Off-Volume - Model 1806
	Knob	33D143-2	On-Off-Volume - Model T1807
	Knob	33D143-1	Contrast, Vert., Brightness - Model T1801
	Knob	33D143-5	Contrast, Vert., Brightness - Model T1802
	Knob	33D143-3	Contrast, Vert., Brightness - Model T1806
	Knob	33D143-2	Contrast, Vert., Brightness - Model T1807
	Safety Glass	21B62-13	All Models
	Mask	23D211	All Models

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
Note: Receiver chassis has one side connected directly to the 117 volt line.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 5J6 with pin 1 removed.
Disconnect antenna and short antenna terminals with a short jumper. Set the contrast control for minimum contrast.
Connect the negative lead of a 3 volt bias supply thru 10KΩ to the ungrounded side of C29. Positive lead to chassis.
Use only enough generator output to provide usable indication on VTVM, 1 volt maximum. Allow 15 to 20 minutes for test equipment and receiver to warm up.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	27.25MC (unmod)	Any	DC probe thru decoupling filter (Fig. 1) to point Ⓐ. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	25.3MC	"	"	A2, A3	Adjust for maximum deflection.
3.	"	"	23.1MC	"	"	A4, A5	"

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment".
Use only enough sweep generator output to provide usable indication on scope. Set contrast control for minimum contrast.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Use very short leads.	24MC (10MC Swp)	21.25MC 22.0MC 24.3MC 25.75MC 27.25MC	Any	Vert. amp. thru decoupling filter (Fig. 1) to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig. 2. If necessary, retouch A1 thru A5 to obtain desired response. Adjust A2 and A3 for position of the 25.75MC marker and amplitude of response curve on high frequency side. Adjust A4 and A5 for position of 22MC marker, A4 and A5 will also affect amplitude of response curve on low frequency side.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Disconnect antenna and short terminals together.
Set contrast control for minimum contrast. Allow time for receiver and test equipment to warm up.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01MFD	High side to pin 8 (plate) of 5AM8 (V5). Low side to chassis.	4.5MC (unmod)	Any non-interfering channel.	DC probe to point Ⓑ. Common to chassis.	A6, A7	Attenuate generator output to maintain 1 volt at VTVM. Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to pin 8 (plate) of 5AM8 (V5). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point Ⓑ. Low side to chassis.	A6, A7	Disconnect stabilizing capacitor C4. Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
6.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A8	Reconnect stabilizing capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Remove bias battery and replace original tuner oscillator tube in its socket. Tune in a TV station. Adjust A6 and A7 with VTVM connected as in step 5 of "Sound IF Alignment Using AM Signal Generator and VTVM". Adjust A8 for best program sound with minimum buzz. This point will be found between two maximum buzz peaks.

4.5MC TRAP ALIGNMENT

Short L19 with a short jumper wire.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 8 (plate) of 5AM8 (V5). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A9	Connect a 10MMF capacitor from pin 6 (plate) of 5AN8 (V6) to pin 6 (cathode) of 3AU6 (V7). Use lowest scale on VTVM and adjust for MINIMUM deflection.

TUNER ALIGNMENT (94D85-1)

The tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

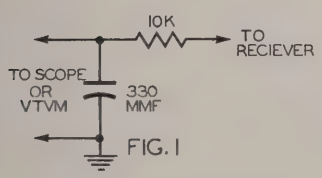

FIG. 1

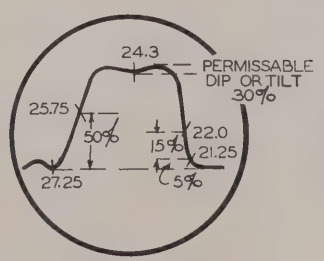

FIG. 2

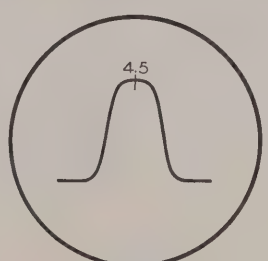

FIG. 3

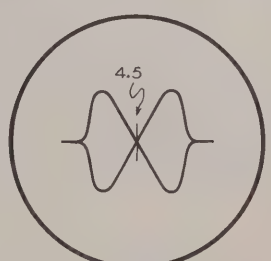

FIG. 4

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

For rear panel service location adjustments see tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made by adjusting the plastic flexible shaft at back of set. Adjust the horizontal lock slug (L26) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L25) located on bottom of chassis. Adjustment can be made from top of chassis by inserting alignment tool through hollow hex slug (primary adjustment) to bottom adjustment on L25.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL FROM MOUNTING BOARD

1. Remove 6 push-on type control knobs from side panel of cabinet.
2. Remove 2 metal screws from antenna bracket.
3. Remove 9 metal screws. Remove rear cover.
4. Remove 2 wood screws. Remove AC interlock.
5. Disconnect speaker plug.
6. Remove 2 metal speaker screws. Remove speaker.
7. Disconnect ground strip (from cabinet to chassis).
8. Remove 8 cabinet bolts, lift cabinet from mounting board.

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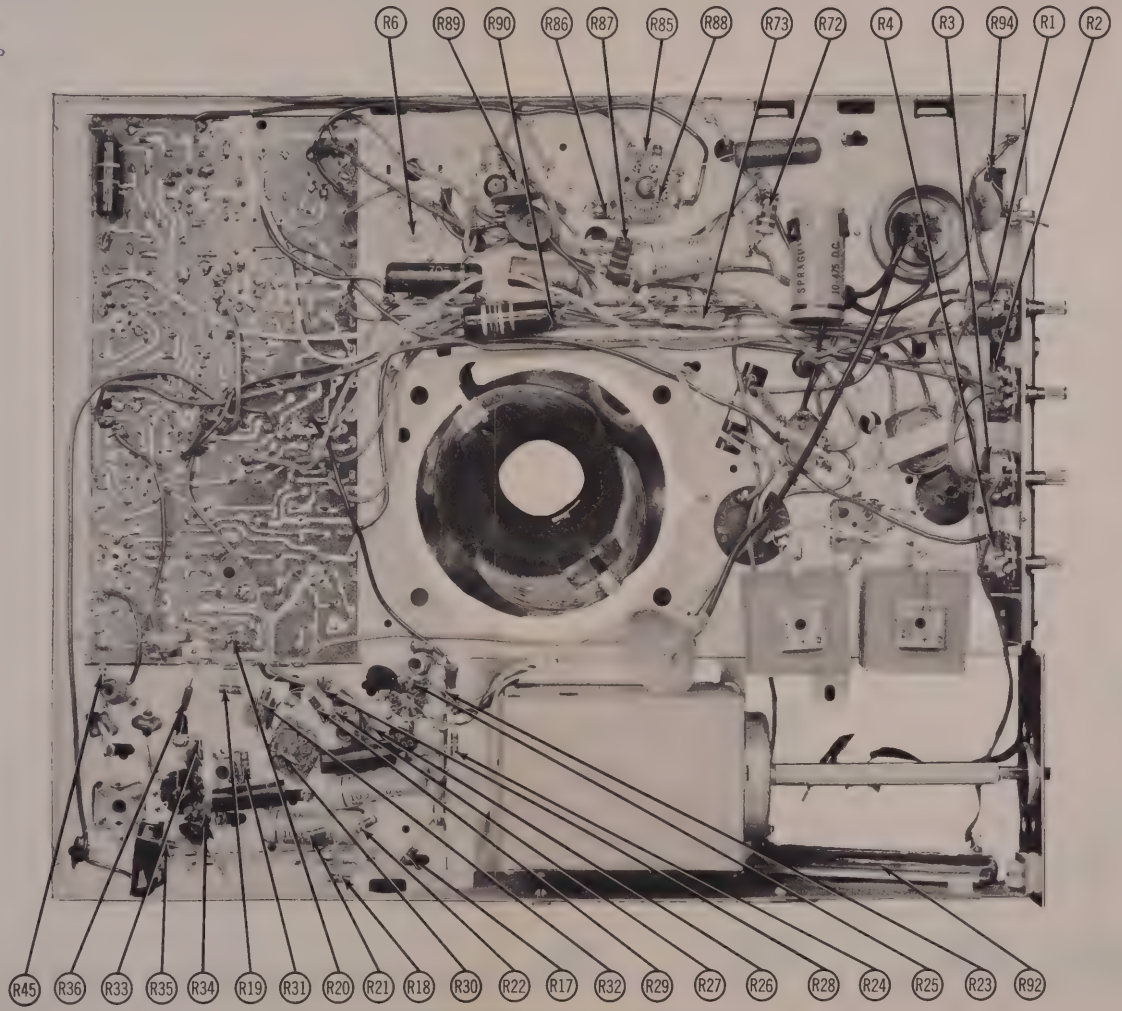

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ADMIRAL
MODEL 3G18 (Ch. 3G1)

ADMIRAL
MODEL 3G18 (Ch. 3G1)

L. I
3924 ME ST.
DENVER, COLORADO

ADMIRAL
MODEL 3G18 (Ch. 3G1)

TRADE NAME	Admiral Model 3G18 (Ch. 3G1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amp., 50L6GT Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .21 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

ADMIRAL MODEL 3G18 (Ch. 3G1)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amp.	12AU6	12AU6	7BK	
V2	Audio Output	50L6GT	50L6GT	7S	
V3	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	30	150	67A14-3			TCT3055	TDL-T30-150	FMT-1530	
B	30	150				TC47	TD-25-25	FM-0225	
C	20	150							
D	20	25							
C2	4	25	67A4-3			TC30	TD-4-25	MMT-0505	
C3	.1	200	64B5-30	DF-104		PT401	IMP2-P1	330201	
C4	10000		65C10-3	DD-103	811-01	DC-511	IMP4-S1	330411	
C5	100		65C6-3	D6-101	GP1K-101	UC-531		K-1310	
C6	10000		65C10-3	DD-103	811-01	DC-511	IMP4-S1	330411	
C7	.002	600	65B1-14	D6-202	GP2-333-202	PT622	IMP6-D2	330622	
C8	.1	200	64B1-30	DF-104		PT401	IMP2-P1	330201	
C9A	10000		♦63A5-6	♦PC-81	♦1404-02				
B	250								
C									
C10	10000		65C10-3	DD-103	811-01	DC-511	IMP6-S1	330611	
C11	.047	400	65A13-5	DF-503		PT4147	IMP4-S47	3304147	
C12	.1	400	65B1-20	DF-104		PT401	IMP4-P1	330401	

♦ Items C9A, C9B, C9C, R7A and R7B are combined in one unit.
When replacing items separately, C9B and C9C should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	75C1-70	Q11-139	A47-2Meg-S	AB-75	U-56	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2	3Meg	½	75C2-19				UT-457	Volume tapped at 1.5Meg

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	330KΩ	½	60B8-334	BTS-330K	
R4	27KΩ	½	60B8-273	BTS-27K	
R5	3300Ω	½	60B8-332	BTS-3300	
R6	270KΩ	½	60B8-474	BTS-270K	
R7A	250KΩ	½	♦63A5-6	BTS-220	
B	500KΩ	½		BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R8	150Ω	½	60B8-151	BTS-150	
R9	1000Ω	½	60B8-102	BTS-1000	
R10	6800Ω	½	60B8-682	BTS-6800	
R11	220Ω	1	60B14-221	BTA-220	
R12	150Ω	5	61A16-5	PW7-150	

♦ Items R7A, R7B, C9A, C9B and C9C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.2KΩ	3.2Ω	79A11-3	Z1102 ①	A-2928	A-3876	24S50	S-2X	① Tape primary tap.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	6"	PM	3.2Ω	78B81-3	6A15	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: ADMIRAL PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1	409B19-9	ACD-D-J	A-1 A-3	46T	0-1 or S-1 and 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

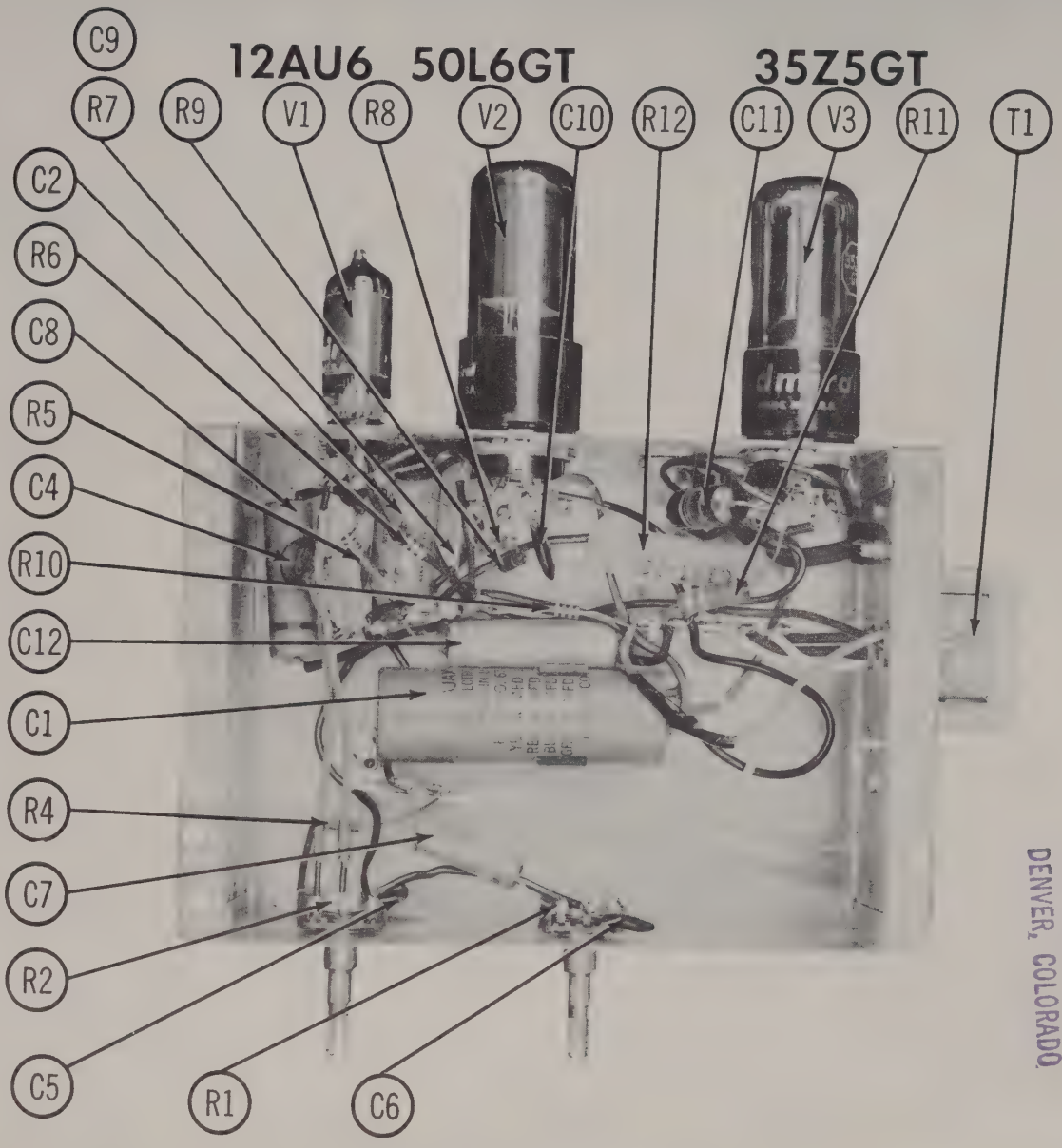
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: ADMIRAL PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2	(98B15-34) (78RPM Needle)	*JP-30 or †JPS-30 or ♦JPS-30D and	*C-320 or †C-318 or ♦C-318D and	*W-30A or †W-30S or ♦W-30D and	* Metal † Jewel ♦ Diamond
M3	(98B15-35) (33 1/3 - 45 Needle)	*JP-30LP or †JPS-30LP or ♦JPS-30LPD	*A-322 or †A-300 or ♦A-300D	*W-30MGA or †W-30MGS or ♦W-30MGD	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Switch	G400A606	Reject-On-Off & Mounting Plate
M5	Phono Motor	407C20	
	Cabinet	35E309-1	
	Handle	35E309-58	Carrying
	Knob	33B81-10	With Pointer



CHASSIS-BOTTOM VIEW

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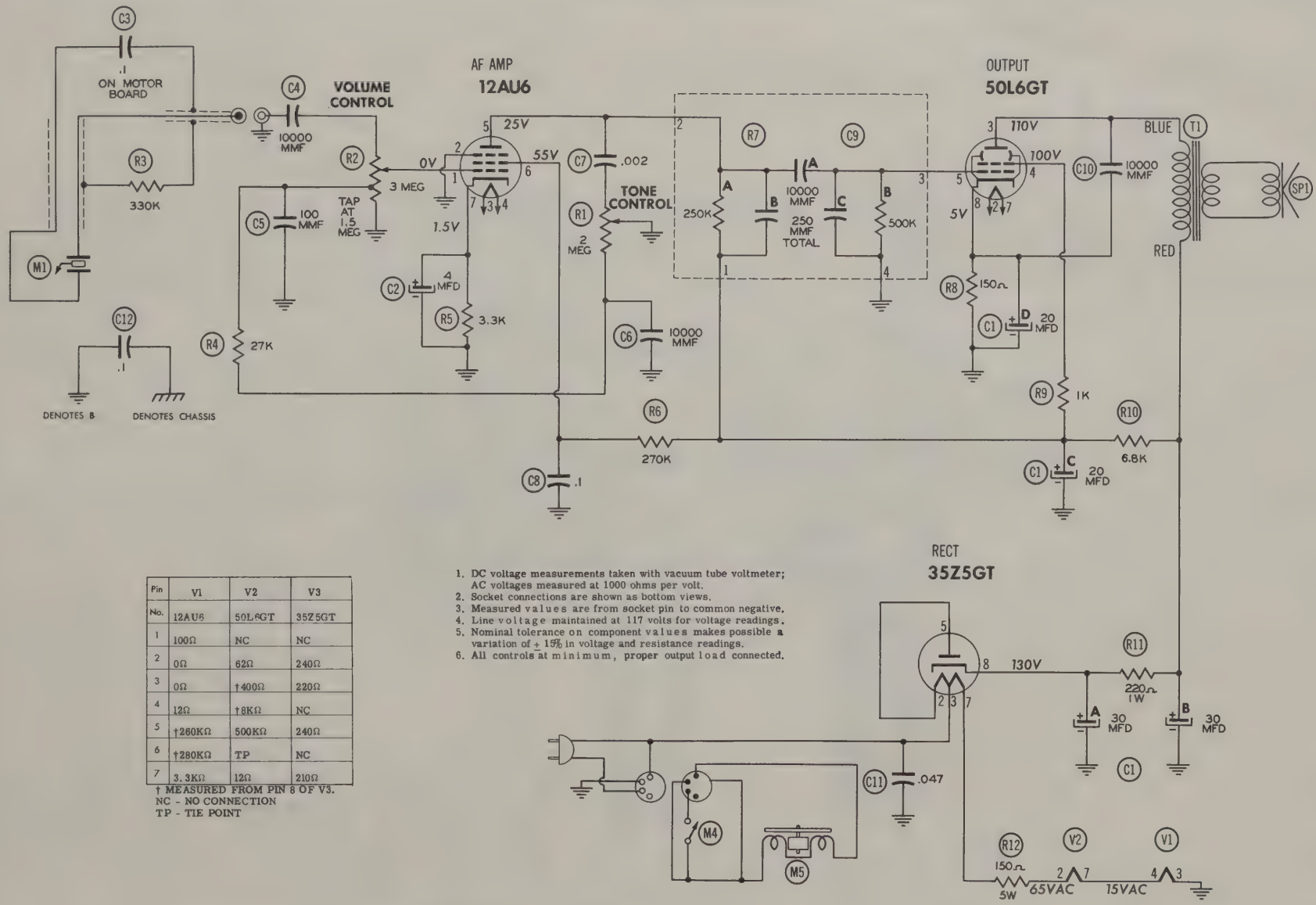

Pin No.	V1	V2	V3
1	12AU6	50L6GT	35Z5GT
2	100Ω	NC	NC
3	0Ω	62Ω	240Ω
4	0Ω	†400Ω	220Ω
5	12Ω	†8KΩ	NC
6	†260KΩ	500KΩ	240Ω
7	†280KΩ	TP	NC
	3.3KΩ	12Ω	210Ω

† MEASURED FROM PIN 8 OF V3.
NC - NO CONNECTION
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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RETMA MEMBER

AIRLINE MODELS
WG-5002B, WG-5003B

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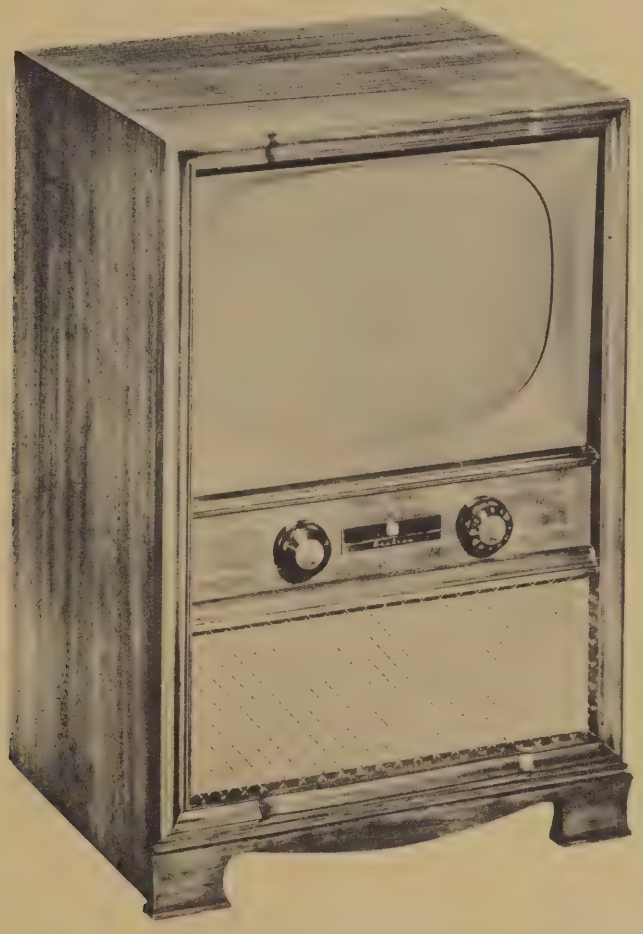

MODEL WG 5003B

AIRLINE MODELS
WG-5002B, WG-5003B

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AIRLINE MODELS
WG-5002B, WG-5003B

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DENVER, COLORADO

AIRLINE MODELS
WG-5002B, WG-5003B

AIRLINE MODEL WG-5003B

TRADE NAME	Airline Models WG-5002B, WG-5003B
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-three

POWER SUPPLY 110-120 Volts AC - 60 Cycles RATING 1.7 Amp. @ 117 Volts AC
TUNING RANGE Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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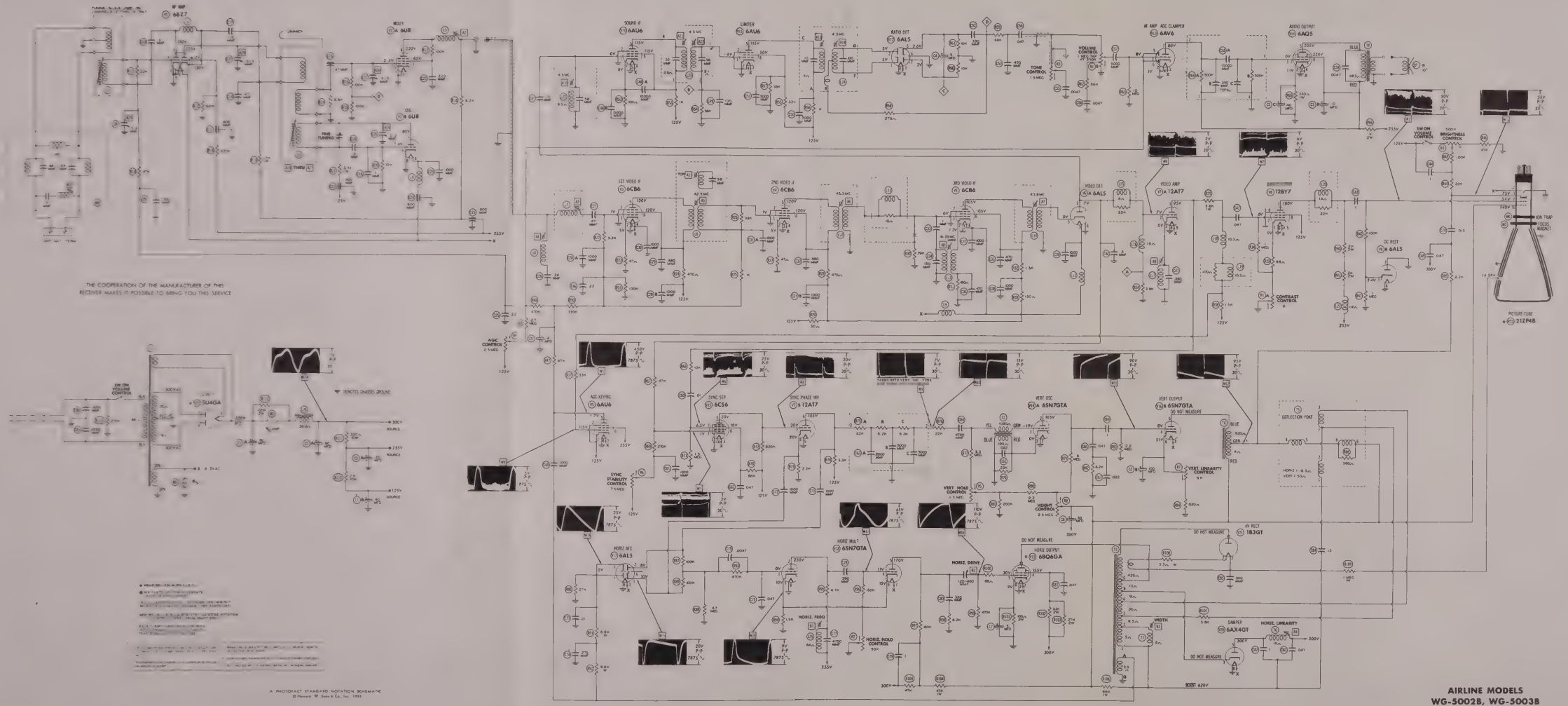
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
AIRLINE MODELS
WG-5002B, WG-5003B

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CHASSIS TOP VIEW

AIRLINE MODELS
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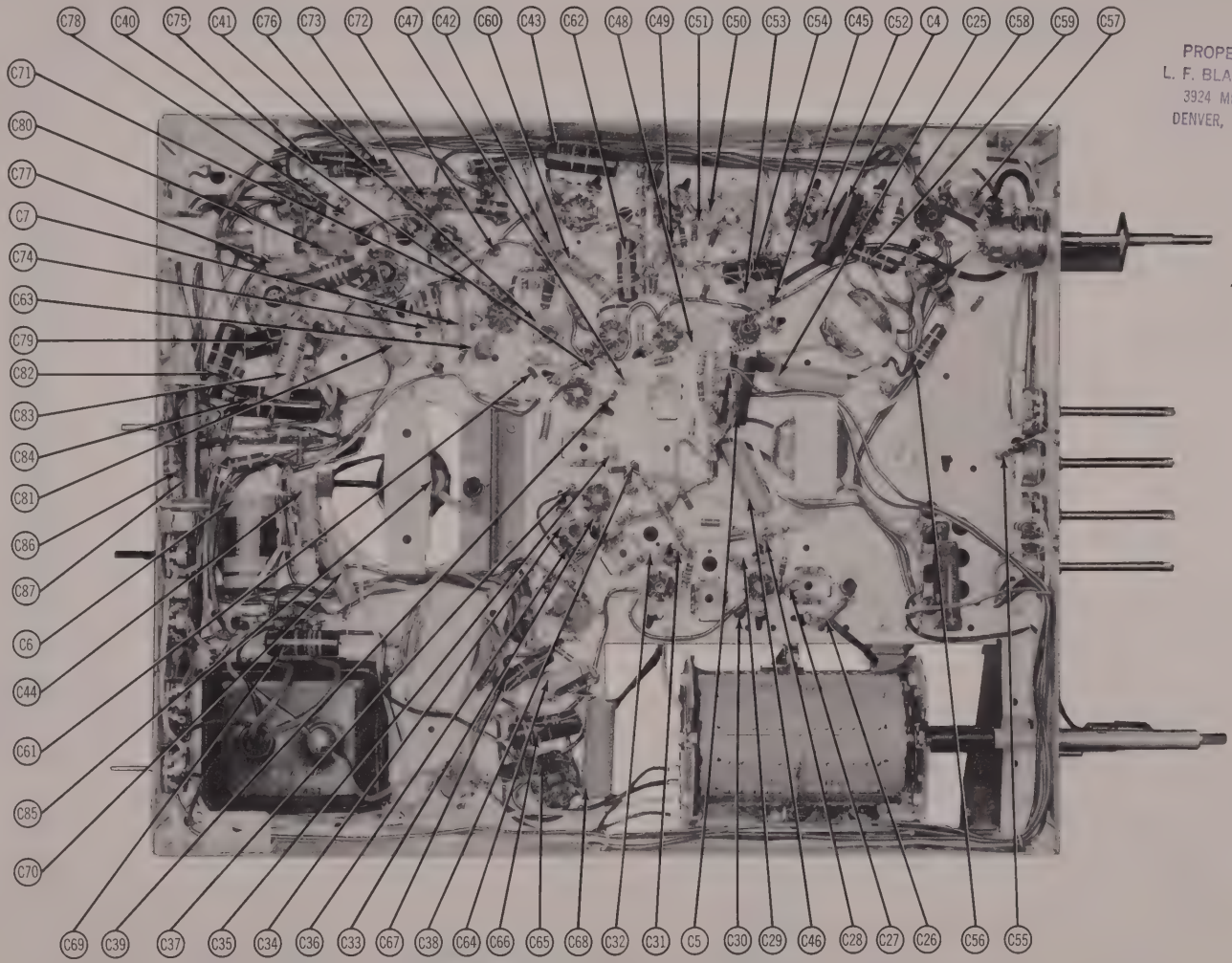

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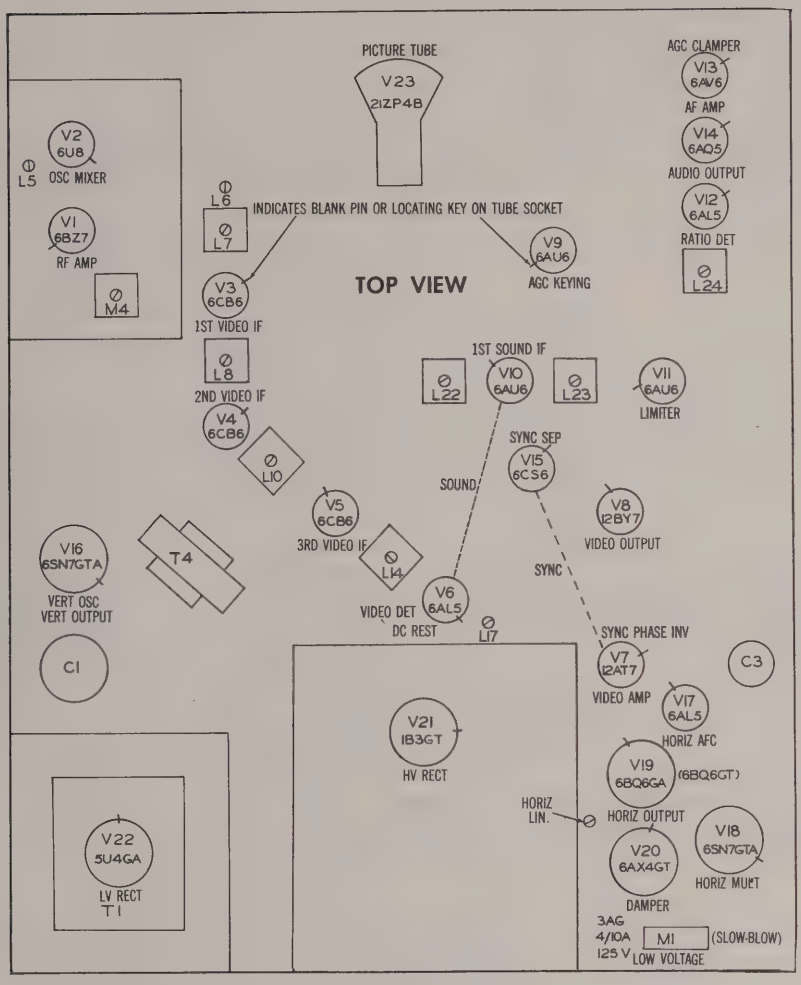
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V8, V9, V23
Has pic, no sound - V10, V11, V12, V13, V14
Overloaded picture - V9, V13

SYNC FAILURE
No vert. sync - V7, V16
No horiz. sync - V7, V17, V18
No vert. or horiz. sync - V7, V15

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V23
No vertical deflection - V16
Poor vert. linearity or foldover - V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22
Vert. off freq. - V7, V16
Horiz. off freq. - V7, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C28A. Connect the positive lead to chassis.
Remove the RF amplifier tube (V1) from its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to tuner chassis.	44MC (10MC Swp)	41.25MC 45.75MC 47.25MC	Any unused channel.	Vert. amp. thru detector (Fig. 1) to pin 5 (plate) of 6CB6 (V3). Low side to chassis.	A1, A2, A3, A4	Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2, A3 and A4 for response similar to Fig. 2. A2 and A3 affect the flat portion of curve. A4 positions the 41.25MC marker. Make sure 45.75MC marker is on peak as shown or 44.5MC marker on overall response will be incorrect.
2.	"	"	Not used.	42.5MC (Unmod)	"	Use VTVM. DC probe to point Ⓐ. Common to chassis.	A5	Increase bias from 1.5 volts to 4.5 volts at ungrounded side of C28A. Attenuate generator output to maintain 1 volt at VTVM. Adjuse for maximum deflection.
3.	"	"	"	45.3MC	"	"	A6	"
4.	"	"	"	43.9MC	"	"	A7	"
5.	"	"	"	41.25MC	"	"	A8	Adjust for MINIMUM deflection.
6.	"	"	44MC (10MC Swp)	41.25MC 42.25MC 42.5MC 43.9MC 44.5MC 45.3MC 45.75MC 47.25MC	"	Vert. amp. thru 10KΩ to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig. 3. SLIGHTLY retouch A5 thru A8 to obtain desired response. If A1 thru A4 requires retouching, step 1 should be repeated.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V6A). Low side to chassis.	Not used.	4.5MC (400∿ Mod)	Any unused channel.	Vert. amp. to pin 2 (grid) of picture tube. Low side to chassis.	A9	Adjust for MINIMUM 400∿ indication on scope.

ALTERNATE 4.5MC TRAP ALIGNMENT

Replace the RF amplifier tube (V1) and remove bias battery. Tune in a TV station and adjust A9 for minimum 4.5MC beat interference in picture.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove 6CB6 (V5) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V6A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V5 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6 (V5) from its socket.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V6A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point Ⓑ. Low side to chassis.	A10, A11, A12	Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
9.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A13	Disconnect stabilizing capacitor C4. Use only enough sweep generator output to provide usable indication on scope. Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
10.	"	"	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A14	Reconnect stabilizing capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines. Replace V5 in its socket.

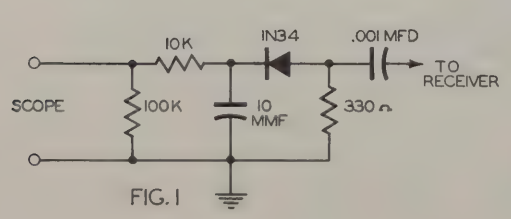

FIG. 1

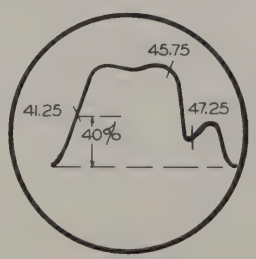

FIG. 2

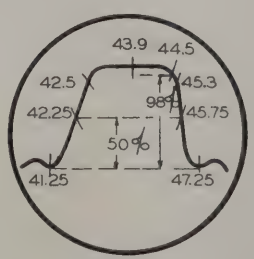

FIG. 3

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ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt battery to the ungrounded side of C28A. Positive lead to chassis.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A15 adjustment. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within range of the fine tuning control, it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just to the left of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Replace the RF amplifier (V1) in its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should be at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A17	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A18	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A19	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A20	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A21	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A22	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A23	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A24	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A25	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A26	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A27	

RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C25. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205. 25MC 209. 75MC	12	Vert. amp. thru 10KΩ to point (E). Low side to chassis.	A28, A29, A30	Adjust for response similar to Fig. 7 with markers above 90%.
13.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		If markers fall below 70% on any channel, make compromise adjustment of A28, A29 and A30 with channel switch set to that channel. Then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

IF WAVE TRAP ADJUSTMENT

The IF wave trap should be tuned to minimize interference caused by signals which fall within the video IF bandpass (40-48MC). Tune in a station on which the interference is noted and adjust A31 for minimum interference in the picture.

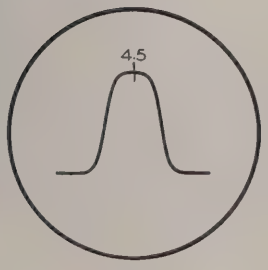


FIG.4

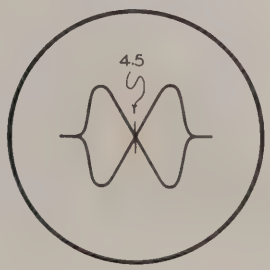


FIG.5

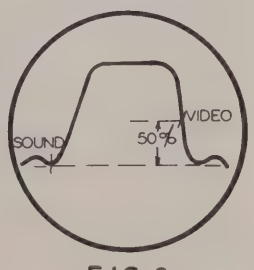


FIG.6

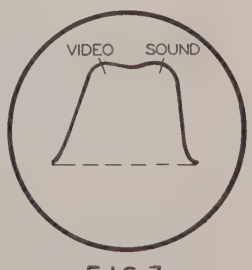
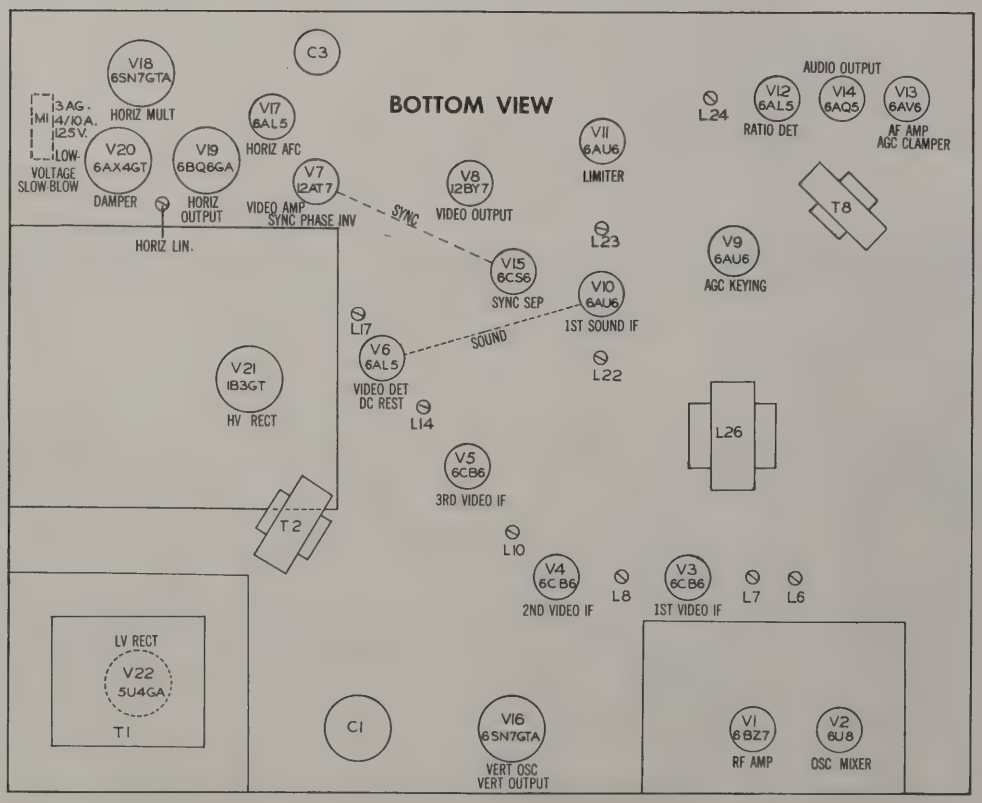


FIG.7

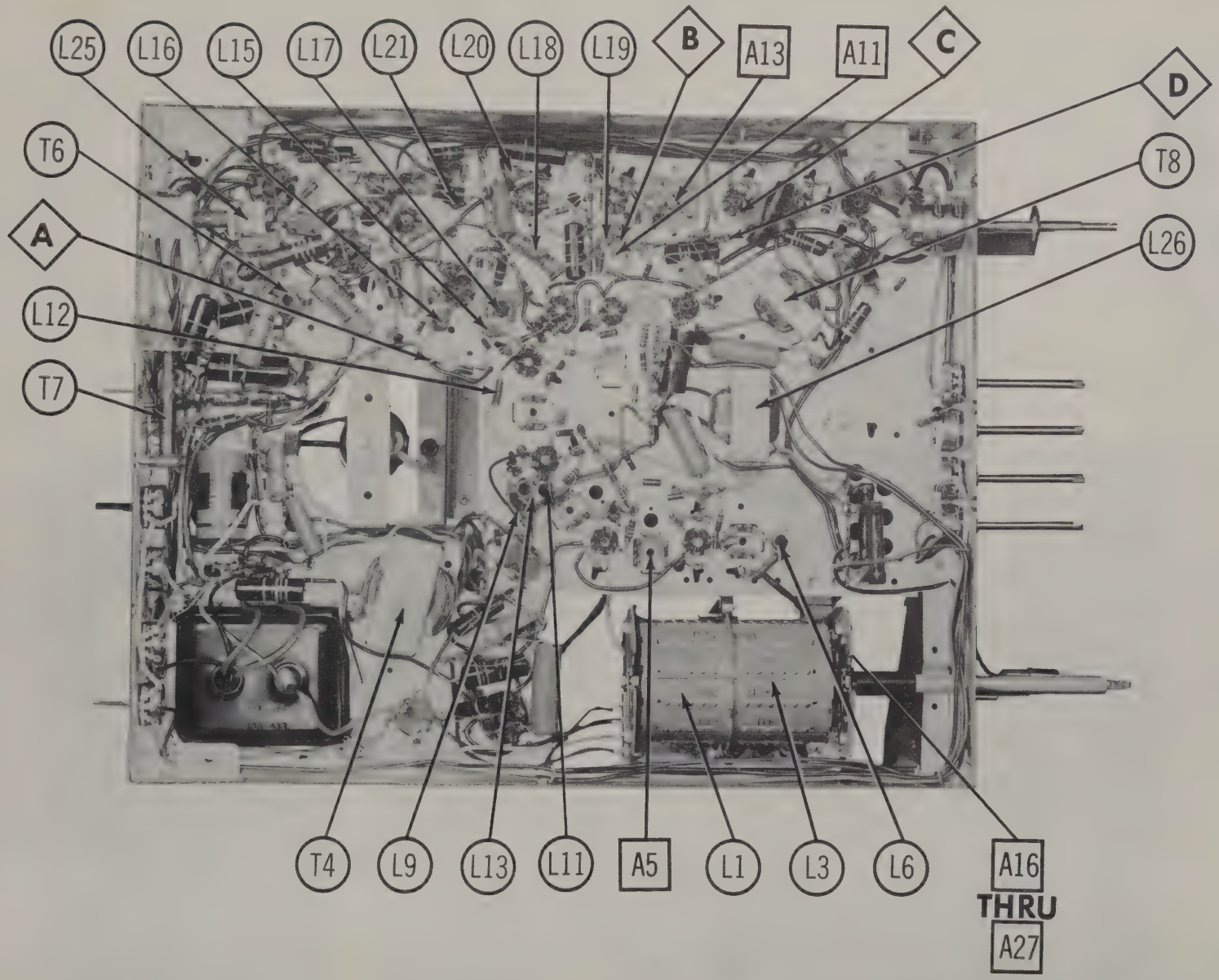
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	†1. 8KΩ	†300KΩ	INF	0Ω	. 1Ω	INF	750KΩ	0Ω	0Ω
V 2	6U8	†5. 5KΩ	200KΩ	†100KΩ	. 1Ω	0Ω	†8. 5KΩ	0Ω	0Ω	10KΩ
V 3	6CB6	80KΩ	47Ω	0Ω	. 1Ω	†2. 8KΩ	†2. 8KΩ	0Ω		
V 4	6CB6	80KΩ	47Ω	0Ω	. 1Ω	†3KΩ	†3KΩ	0Ω		
V 5	6CB6	. 2Ω	180Ω	0Ω	. 1Ω	†4KΩ	†4KΩ	0Ω		
V 6	6AL5	1Meg	3. 9KΩ	. 1Ω	0Ω	. 5Ω	0Ω	0Ω		
V 7	12AT7	†9KΩ	3. 9KΩ	. 2Ω	0Ω	0Ω	†5. 5KΩ	†820KΩ	3. 3KΩ	. 1Ω
V 8	12BY7	450Ω	1Meg	0Ω	. 1Ω	. 1Ω	0Ω	†4. 5KΩ	†2. 5KΩ	0Ω
V 9	6AU6	†35KΩ	†2. 3KΩ	. 1Ω	0Ω	350KΩ	†400Ω	†2. 3KΩ		
V 10	6AU6	6. 5Ω	0Ω	0Ω	. 1Ω	†3. 3KΩ	†3. 3KΩ	100Ω		
V 11	6AU6	56KΩ	0Ω	. 1Ω	0Ω	†3. 3KΩ	†27KΩ	0Ω		
V 12	6AL5	INF	INF	. 1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 13	6AV6	10Meg	0Ω	. 1Ω	0Ω	750KΩ	750KΩ	†500KΩ		
V 14	6AQ5	500Ω	330Ω	0Ω	. 1Ω	†1. 8KΩ	†1. 3KΩ	500KΩ		
V 15	6CS6	40KΩ	0Ω	. 1Ω	0Ω	†820KΩ	†70KΩ	1. 5Meg		
V 16	6SN7GTA	4Meg	•2. 5Meg	190Ω	2. 2Meg	•8. 5KΩ	2. 2KΩ	0Ω	. 1Ω	
V 17	6AL5	4. 8Meg	4. 8Meg	. 1Ω	0Ω	8. 5KΩ	NC	8. 5KΩ		
V 18	6SN7GTA	5Meg	†5KΩ	1. 5KΩ	180KΩ	†200KΩ	1. 5KΩ	. 1Ω	0Ω	
V 19	6BQ6GA	TP	0Ω	TP	†15KΩ	470KΩ	TP	. 1Ω	100Ω	Top Cap •15Ω
V 20	6AX4GT	TP	NC	120KΩ	TP	†55Ω	NC	. 1Ω	0Ω	
V 21	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap •435Ω
V 22	5U4GA	INF	30KΩ	INF	20Ω	INF	19Ω	INF	30KΩ	
V 23	21ZP4B	0Ω	1. 1Meg	Pin 10 •6. 8KΩ	Pin 11 †250KΩ	Pin 12 . 1Ω				

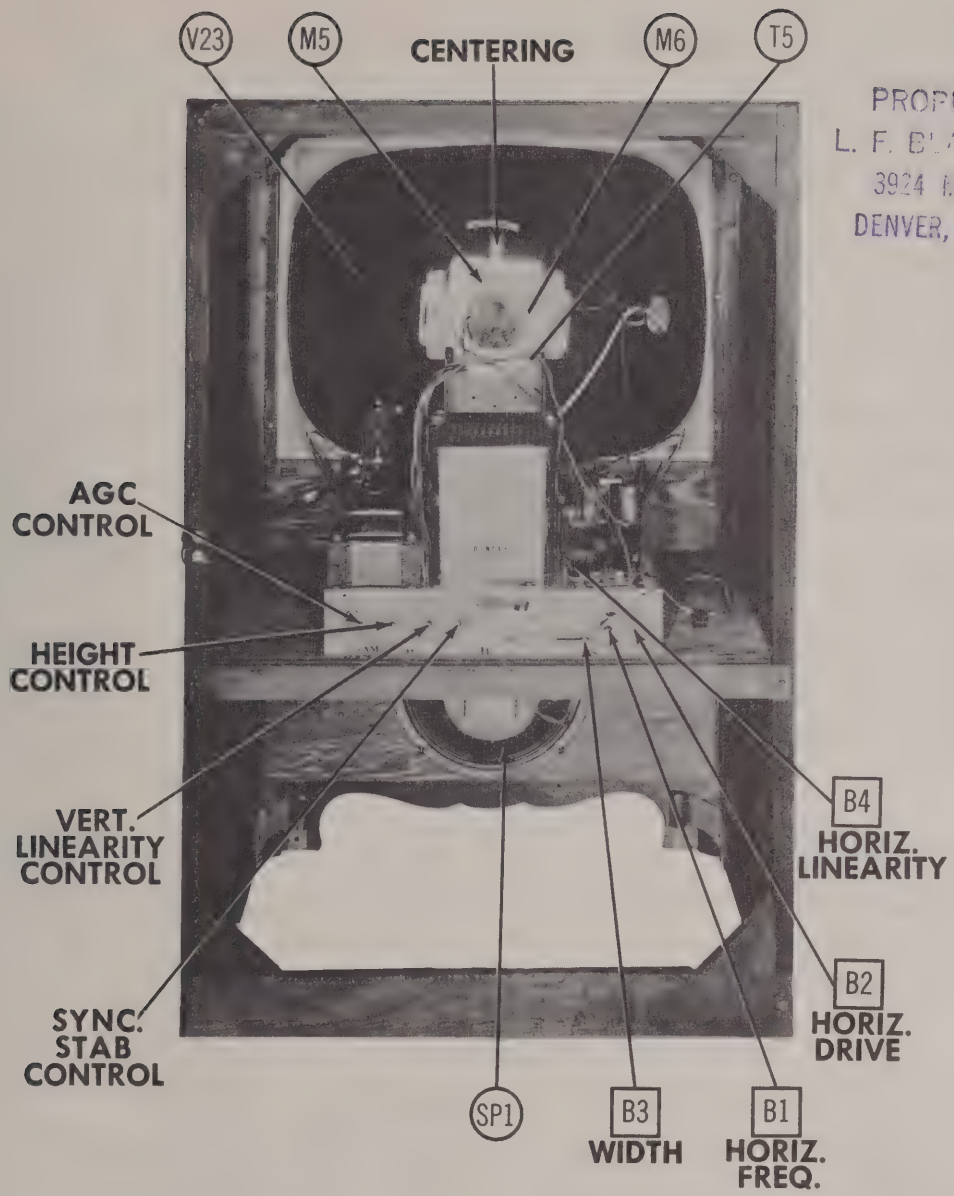
† MEASURED FROM PIN 2 OF V22.
• MEASURED FROM PIN 3 OF V20.
TP - TIE POINT
NC - NO CONNECTION



TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



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CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. If horizontal hold control fails to maintain sync, set it in the middle of its range and adjust the horizontal frequency slug B1 until the picture is in sync.

Check other channels and if necessary, readjust B1 slightly for best sync on all channels. With picture locked in sync, turn contrast control (R1A) to minimum, adjust brightness control for a washed-out picture.

Adjust the width control (B3) for a picture slightly wider than necessary to fill mask horizontally.

Turn horizontal drive trimmer (B2) inward (if necessary) until horizontal drive line disappears.

Adjust horizontal linearity slug (B4) for a picture that is symmetrical from left to right. Adjust the picture centering device located in front of focus magnet to center picture in the mask.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20 and V22. Check adjustments B2, B3 and B4. Check T3, T5A, R102, R103, C80, C7 and other associated components.

DRIVE LINES

Check by substitution V19 and V20. Check adjustments B2 and B4. Check R102, R103, T3, T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V19 and V20. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V18, V19 and V20. Check C76 for open. Check L25, C77, C75, R94 and other associated components.

XMAS TREE EFFECT

Check by substitution V18, V19 and V20. Check T3 and T5 for internal arcing. Check C74, C73, C77, C78, L25, R91, R92, R96 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V16. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R84, C2B and other associated components.	Check C66, C68, R79, R8, R106, R77, T2 and other associated components.

INSUFFICIENT SWEEP

Substitute V16. Check height and vertical linearity controls for proper operation. Check R79, T4 and other associated components.

COMPRESSED AT BOTTOM

Substitute V16. Check R106, R8, R79, C68, T2 and other associated components.

COMPRESSED AT TOP

Substitute V16. Check R84, R7, C2B, C68, T4 and other associated components.

FOLDS

Substitute V16. Check C66, C67, C68, R82 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V15 and V7. Check C60, C62, R68, R70, R72, R74 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V16. Check vertical integrator network. Check R77, R5, R78, T2, C64 and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check horizontal AFC network. Check C71, C72, L25, R96, R2, R94 and other associated components.

HORIZONTAL BENDING

Check by substitution V7, V15, V17 and V18. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V7 and V8. Check C42, C43, R35, R36, R40, R41, L18, L21 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A9. Check video IF alignment.

POOR CONTRAST

Check by substitution V7 and V8. Check contrast control. Check L19, L20, L15, C42, C43 and other associated components.

NEGATIVE PICTURE

Check by substitution V7 and V8. Check picture tube. Check L16, L19, L20, C42, C43, R39 and other associated components.

SMEAR

Check by substitution V7 and V8. Check L15, L16, L19, L20, C42, C43 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11, V12, V13 and V14. Check stages V13 and V14 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C54, C57, C58A, C59, C3C, C3B, R66, R64A, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A14 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check M1 fuse. Substitute V22. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V22. Check B+ filter and decoupling network.

L. F. BLANKENSHIP.
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	6BZ7	6BZ7	9AJ	
V2	Mixer-Osc.	6U8	6U8	9AE	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Det-DC Restorer	6AL5	6AL5	6BT	
V7	Video Amp-Sync Phase Inv.	12AT7	12AT7	9A	
V8	Video Output	12BY7	12BY7	9BF	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st Sound IF Amp.	6AU6	6AU6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Ratio Det	6AL5	6AL5	6BT	
V13	AF Amp-AGC Clamper	6AV6	6AV6	7BT	
V14	Audio Output	6AQ5	6AQ5	7BZ	
V15	Sync Sep.	6CS6	6CS6	7CH	
V16	Vert. Osc.				
	Vert. Output	6SN7GTA	6SN7GTA	8BD	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6BQ6GA	6BQ6GA	6AM	6BQ6GT used as an alternate
V20	Damper	6AX4GT	6AX4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4GA	5U4GA	5T	5U4G used as an alternate

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V23	21ZP4B ①	21ZP4B ① 21ZP4A	21ZP4B ① 21ZP4A	21ZP4B ③ 21ZP4A 21ZP4 ②	21ZP4B ① 21ZP4A	12N 12N	① Aluminized ② Circuit change necessary. ③ Silver Screen.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C1A	▲80	400	45X390			FP229.4	TM-D80-450	T-180	
B	▲60	400							
C2A	▲80	400	45X391			FP229.8	TM-3057	T-720	
B	▲100	50							
C3A	■20	400	45X392			FP366	TM-3037	T-700	
B	▲10	400							
C	40	50							
C4	5	25	45X378			TC30	TD-5-25	MMT-0505	
C5	4	100	45X361			TC40	TD-4-150	FM-1504	
C6	30	400	45X393			TC77	TD-30-450	FM-4530	
C7	5	25	45X378			TC30	TD-5-25	MMT-0505	
C8	3-9		31A-079	829-10					
C9	1000		13L-8X102Z	DD-102	801-001	DC-521			
C10	3		13L-8C030K	TCZ-3	NP0A-030	ZT-5533			
C11	800		13M-28N102Z-03						
C12	.5-3		31A-056-1	829-3	3115-01-0R5	CT-565A			
C13	1.5		13L-8C1R5C	TCZ-1.5	NP0A-1R5	ZT-5515			
C14	47		13L-8Q470K	D6-470	831-470	UC-5447			
C15	800		13M-28N102Z-03						
C16	47								
C17	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A			
C18	5		13L-8UA050C						
C19	10		13L-8T100A						
C20	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A			
C21	800		13M-28N102Z-03						
C22	220		13L-12D221K	D6-221	811-221	UC-5322			
C23	1000		13L-8X102Z	DD-102	801-001	DC-521			
C24	800		13M-28N102Z-03						
C25	.22	200	RCP10M2224M			PT4022	IMP2-P22	3302022	
C26	36		47X626						
C27	47		47X603	D6-470	GP1K-470	UC-5447		K-1447	
C28A	1000		80X3	DD2-102	812-001	DCD-521			
B	1000								
C29	680		80X5	DD-681	811-681	UC-5368			
C30	1000		80X1	DD-102	801-001	DC-521			
C31A	1000		80X3	DD2-102	812-001	DCD-521			
B	1000								
C32	680		80X5	DD-681	811-681	UC-5368			
C33	1		47X588	TCZ-1	NP0A-010				
C34	150	500	RCM15E151K	TCZ-150	NP0-334-151	MCB236		KR-1315	
C35	470		80X4	DD-471	831-471	UC-5347		K-1347	
C36	470		80X4	DD-471	831-471	UC-5347		K-1347	
C37	1000		80X1	DD-102	801-001	DC-521			
C38	1000		80X1	DD-102	801-001	DC-521			
C39	1000		80X1	DD-102	801-001	DC-521			
C40	5		47X562	TCZ-5	NP0A-050	ZT-555			
C41	360	500	47X568					KR-1336	
C42	.047	400	RCP10M4473M	DF-503		PT4147	IMP4-S47	3304147	
C43	.1	400	RCP10M4104M	DF-104		PT401	IMP4-P1	330401	
C44	.1	200	RCP10M2104M	DF-104		PT401	IMP2-P1	330401	
C45	1000		80X1	DD-102	801-001	DC-521	IMP6-D1	K-1210	
C46	.22	200	RCP10M2224M			PT4022	IMP2-P22	3302022	
C47	1.5		47X584	TCZ-1.5	NP0A-1R5	ZT-5515			
C48A	10000		80X6	DD3-103	811-01	DC-511			
B	10000				811-01	DC-511			
C49	100		47X604	D6-101	GP1K-101	UC-531		K-1310	
C50	5000		47X507	DD-502	811-005	DC-525		C-1250	
C51	5000		47X507	DD-502	811-005	DC-525		C-1250	
C52	330	500	47X570	D6-331	GP2K-331	UC-5333		K-1333	
C53	470	500	47X525	D6-471	GP2K-471	UC -5347		K-1347	
C54	.047	200	RCP10M2473M	DF-503		PT4147	IMP2-S47	3302147	
C55	.0047	400	RCP10M4472M	D6-472	GP2-333-472	PT6247	IMP6-D47	3306247	

PROPERTY OF
L. F. [illegible]
[illegible] ST.
DENVER, COLORADO

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA AIRLINE Part No.	CENTRALAB Part No.	ERIE Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	NOTES
C58	.0047	400	RCP10M4472M	DE-472	GP3-333-472	PT6247	DMPE-D47	3306247	
C57	5000		47EX50*	DD-508	811-508	DC-525	DMPE-D5	C-1250	
C58A	10000								
B			??EX5	?PC-50	?1404-01				
C	250								
C58	.0047	600	RCP10M4473M	DE-473	GP3-333-472	PT6347	DMPE-D47	3306347	
C59	.01	400	RCP10M4103M	DE-103	GP3-333-103	PT6310	DMPE-D1	330411	
C61	1000		98X1	DD-102	801-001	DC-531	DMPE-D1	C-1210	
C62	.047	400	RCP10M4473M	DF-503		PT6147	DMPE-D47	3304147	
C63A	5000					DC-532	DMPE-D2	C-1220	
B	5000		47EX7	?PC-100	?1408-01	DC-533	DMPE-D5	C-1250	
C	5000					DC-535	DMPE-D5	C-1250	
C64	4700	500	47EX43			MC2468		CR-1247	
C65	.022	200	RCP10M2233M	DF-203	817-03	PT4133	DMPE-S33	3304133	
C66	.047	400	RCP10M4473M	DF-503		PT6147	DMPE-D47	3306147	
C67	.033	200	RCP10M2333M	DF-303	817-03	PT4133	DMPE-S33	3304133	
C68	.1	600	RCP10M6104M	DF-104		PT6101	DMPE-P1	330601	
C69	.047	600	RCP10M6473M	DF-503		PT6147	DMPE-D47	3306147	
C70	.015	600	RCP10M6153M			PT6115	DMPE-S15	3306115	
C71	1000		98X1	DD-102	801-001	DC-531	DMPE-D1	K-1210	
C72	1000		98X1	DD-102	801-001	DC-531	DMPE-D1	K-1210	
C73	.01	400	RCP10M4103M	DE-103	GP3-333-103	PT6110	DMPE-S1	330411	
C74	.270	500	RCP30A331K	DE-371	GP3E-371	MC2341		K-1247	
C75	.0047	400	RCP10M4472M	DE-472	GP3-333-472	PT6347	DMPE-D47	3306347	
C76	.047	200	RCP10M2473M	DF-503		PT4147	DMPE-S47	3304147	
C77	4700	500	47EX43			MC2468		CR-1247	
C78	390	500	CKM3D391J			MC2343		KR-1339	
C79	.1	600	RCP10M6104M	DF-104		PT6101	DMPE-P1	330601	
C80	330	500	47EX70					KR-1333	
C81	.047	400	RCP10M4473M	DF-503		PT6147	DMPE-D47	3306147	
C82	.1	400	RCP10M4104M	DF-104		PT6101	DMPE-P1	330601	
C83	.047	400	RCP10M4473M	DF-503		PT6147	DMPE-D47	3306147	
C84	.15	400	RCP10M6154M			PT6115	DMPE-P15	3306115	
C85	500	20000	47EX500	TY3-502	413	HV-20035A			
C86	10000		47EX15	DD-103	811-01	DC-511	DMPE-S1	330611	
C87	10000		47EX15	DD-103	811-01	DC-511	DMPE-S1	330611	

† Items C58A, C58B, C58C, R64A and R64B are combined in one unit.
When replacing items separately C58B and C58C should total 250MMF.
♦ Items C58A, C58B, C58C, R75A, R75B, and R75C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1000Ω	½	87EX21	*QJ-638	ETY-503	P1-4	UP13L	Contrast - Panel
B	1Meg	½				R2-59	UR16-1284	Volume tapped at 250KΩ - Rear
C	Switch					KS-3	US-87	Attach to R1B
R2A	50KΩ	½	2-6X23SB-C	QH-133	A47-50K-S	AB-33	U-35	Horiz. Hold
B	Shaft		Not Req.	HQ	RS-3/16	AK-4	Not Req.	Attach to R2A
R3A	1.5Meg	½	2-6X2334-E	QH-138	A47-1.5Meg-S	AB-75	U-158	Tone
B	Shaft		Not Req.	HQ	RS-3/16	AK-4	Not Req.	Attach to R3A
R4A	500KΩ	½	2-6X2333-A	QH-133	A47-500K-S	AB-59	U-50	Brightness
B	Shaft		Not Req.	Not Req.	RS-3/16	AK-8	Not Req.	Attach to R4A
R5A	1.5Meg	½	2-6X2334-E	QH-138	A47-1.5Meg-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	HQ	RS-3/16	AK-4	Not Req.	Attach to R5A
R6A	75 Meg	½	2-6X2370A	QH-143	A47-75Meg-S	AB-89	U-82	Sync Stability
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-4	Not Req.	Attach to R6A
R7A	2000Ω	½	2-6X2375	QH-116	A47-10K-S	AB-14	SU-30	Vert. Linearity
B	Shaft		Not Req.	HQ	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	2.5Meg	½	2-6X3639A	QH-139	A47-2.5Meg-S	AB-83	SU-565	Height
B	Shaft		Not Req.	HQ	FKS-1/4	AK-4	Not Req.	Attach to R8A
R9A	2.5Meg	½	2-6X3639A	QH-139	A47-2.5Meg-S	AB-83	SU-565	AGC
B	Shaft		Not Req.	HQ	FKS-1/4	AK-4	Not Req.	Attach to R9A

* CONCENTRIC EQUIVALENT: KIT K-4, BASE ELEMENTS & SHAFTS: B11-108 & P6-31B (PANEL)
B13-137X & R16-31B (REAR)
76-2 SWITCH

RESISTORS

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA AIRLINE Part No.	IRC Part No.	NOTES
R10	47KΩ	½		BTS-47K	
R11	22KΩ	½		BTS-22K	
R12	820KΩ	½		BTS-820K	
R13	1500Ω	1		BTS-1500	
R14	470KΩ	½		BTS-470K	
R15	100KΩ	½		BTS-100K	
R16	100KΩ	½		BTS-100K	
R17	100KΩ	½		BTS-100K	
R18	8200Ω	½		BTS-8200	
R19	6800Ω	½		BTS-6800	
R20	10KΩ	½		BTS-10K	
R21	3300Ω	1		BTA-3300	
R22	33000Ω	5%	1	BTS-33000 5%	
R23	4.7Ω 5%	½	1 B43470	BTS-4.7 5%	
R24	470Ω	½	1 B45471	BTS-470	
R25	1000Ω	½	1 B45103	BTS-1000	
R26	39KΩ 5%	½	1 B43393	BTS-39K 5%	
R27	470Ω 5%	½	1 B43470	BTS-47 5%	
R28	470Ω	½	1 B45471	BTS-470	
R29	150Ω	½	1 B45151	BTS-150	
R30	39KΩ 5%	½	1 B43923	BTS-39K 5%	
R31	180Ω	½	1 B45181	BTS-180	
R32	1500Ω	½	1 B45152	BTS-1500	
R33	150Ω	½	1 B45151	BTS-150	
R34	39000Ω 5%	1	1 B43392	BTS-3900 5%	
R35	56KΩ	½	1 C84563	BTA-5600	
R36	1500Ω	½	1 B44152	BTS-1500	
R37	33KΩ	½	1 B44333	BTS-33K	
R38	1Meg	½	1 B44105	BTS-1Meg	
R39	68Ω	½	1 B44680	BTS-68	
R40	3000Ω 5%	½	1 D43303	BTS-3000 5%	
R41	2000Ω 5%	2	1 D43203	BTB-3000 5%	
R43	100KΩ	½		BTS-100K	
R43	1Meg	½		BTS-1Meg	
R44	22KΩ	½	1 B44233	BTS-22K	
R45	100KΩ	½	1 B45104	BTS-100K	
R46	47KΩ	½	1 B45473	BTS-47K	
R47	47KΩ	½	1 B44473	BTS-47K	
R48	470KΩ	½	1 B44474	BTS-470K	
R49	2.7Meg	½	1 B46275	BTS-2.7Meg	
R50	330KΩ	½	1 B45334	BTS-330K	
R51	100KΩ	½	1 B44104	BTS-100K	
R52	100Ω	½	1 B44101	BTS-100	
R53	1000Ω	½	1 B45103	BTS-1000	
R54	56KΩ	½	1 B44563	BTS-56K	
R55	33KΩ	½	1 B44333	BTS-33K	
R56	1000Ω	½	1 B45103	BTS-1000	
R57	33KΩ	½	1 B44333	BTS-33K	
R58	3700Ω	½	1 B44372	BTS-370	
R59	68KΩ	½	1 B44683	BTS-68K	
R60	10KΩ 5%	½	1 B45103	BTS-10K 5%	
R61	10KΩ 5%	½	1 B45103	BTS-10K 5%	
R63	68KΩ	½	1 B44683	BTS-68K	
R63	10Meg	½	1 B45106	BTS-10Meg	
R64A	500KΩ	♦		BTS-470K	
B	500KΩ	♦		BTS-470K	
R65	220Ω	1	1 C84331	BTA-330	
R66	1000Ω	½	1 B44103	BTS-1000	
R67	47KΩ	½	1 B44473	BTS-47K	
R68	10KΩ	½	1 B44103	BTS-10K	
R69	270KΩ	½	1 B44274	BTS-270K	
R70	68KΩ	½	1 B44683	BTS-68K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA AIRLINE Part No.	IRC Part No.	NOTES
R71	1.5Meg	½	B44155	BTS-1.5Meg	
R72	820KΩ	½	B44824	BTS-820K	
R72	33000Ω	½	B43332	BTS-3300 5%	
R74	33000Ω	5%	B43332	BTS-3300 5%	
R75A	22KΩ			BTS-22K	
B	8200Ω		♦78X7	BTS-8200	
C	8200Ω			BTS-8200	
R76	22KΩ		B44223	BTS-22K	
R77	3.3Meg	5%	B44335	BTS-3.3Meg 5%	
R78	22KΩ	½	B44223	BTS-22K	
R79	1.5Meg	½	B44155	BTS-1.5Meg	
R80	2.2Meg	½	B44225	BTS-2.2Meg	
R81	200KΩ	5%		BTS-200K 5%	
R82	8200Ω	½	B44822	BTS-8200	
R83	2.2Meg	½	B44225	BTS-2.2Meg	
R84	820Ω	½	B44821	BTS-820	
R85	2200Ω	½	B44222	BTS-2200	
R86	560Ω	½		BTS-560	
R87	100KΩ	½	B44104	BTS-100K	
R88	4.7Meg	½	B45475	BTS-4.7Meg	
R89	100KΩ	½	B44104	BTS-100K	
R90	27KΩ	½	B44273	BTS-27K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA AIRLINE Part No.	IRC Part No.	NOTES
R91	680Ω	1	C84683	BTA-6800	
R92	680Ω	1	C84683	BTA-6800	
R93	470KΩ	½	B45474	BTS-470K	
R94	1500Ω	5%	B43152	BTS-1500 5%	
R95	4700Ω	5%	B43473	BTS-4700 5%	
R96	150KΩ	½	B43154	BTS-150K	
R97	180KΩ	½	B44184	BTS-180K	
R98	8200Ω	½	B44822	BTS-8200	
R99	470KΩ	½	B44474	BTS-470K	
R100	68Ω	½	B45680	BTS-68	
R101	100Ω	2	D44101		
R102	33KΩ	2	D44333	BTB-33K	
R103	27KΩ	2	D44273	BTB-27K	
R104	47KΩ	1	B44473	BTS-47K	
R105	47KΩ	2	C84473	BTA-47K	
R106	6800Ω	2	D44682	BTB-6800	
R107	5600Ω	1	B44563	BTS-5600	
R108	3.3Ω	1	43X338		
R109	1Meg	1	C85105	BTA-1Meg	
R110	2000Ω	10	43X285	1 3/4A-3000	
R111	330Ω	10	43X273		
R112	100KΩ	2	D85104	BTB-100K	
R113	2700Ω	1	B85274	BTS-270K	

† Items R64A, R64B, C58A, C58B and C58C are combined in one unit.
♦ Items R75A, R75B, R75C, C58A, C58B and C58C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA AIRLINE Part No.	Stancor Part No.	Merit Part No.	RCA TYPE No	Halldorson Part No.	Thordarson Part No.
T1	117VAC	600VCT	5VAC	53X339A	P-8333①			P9715 ②	
	④ L TA	250ADC	④ 3A						
	SEC. 3	SEC. 4	SEC. 5						
	6.3VAC								
	④ 9.3A								

① Tape small 6.3 volt winding.
② Tape low voltage taps on HV secondary, also low ampere 6.3 volt winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA AIRLINE Part No.	Halldorson Part No.	Merit Part No.	RCA TYPE No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
T2	Vert. Osc. Trans.	54X10	B6703	A-3003	209T1 ①	V40S	A-8125	24A87 ①	A-97X
T3	Horiz. Output Trans.	52X330	FB41① &	HV0-9 &	232T1 &	X110*	A-8137 &	FL-Y-24 &	D-35 &
			RF800①	MWCC-1①	212M1* ①		WC-5①	WC-20①	WC-12①
T4	Vert. Output Trans.	51X168	S1264 ①	A-3030 ①	216T1 ①	V31S ①	A-8141 ①	26B54 ①	A-104X ①
T5A	Yoke-Horiz. (13.5MH)	93A334-1	DF803 ②	MDF-72①	31LD2 ②	Y70F14②	DY-9A ②	Y-4 ②	Y-17 ②
B	Vert. (44MH)								
T6	Horiz.Lin.Coil								
	(1.2-6.5MH)	9A2262	RF800③④	MWC-6③	31SR1	30LR15	WC-8	WC-33	WC-12 ①
T7	Width Coil (1-.5MH)	9A2263			30LR4②	30LR4②	WC-6②	WC-16 ②	

① Drill new mounting hole(s).
② Use original yoke damping network.
③ Enlarge mounting hole.
④ Connect to terms #3 & #4.
⑤ Connect to coded blue and green terms.
⑥ Drill new mounting hole or use original bracket, slider and core.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	6	9	9	10	13	7	9	10
					Jumper			
	5	7	7	8	10 & 11	4	7	8
	4				6			
		See Note ⑦	See Note ⑦	See Note ⑦	4	See Note ⑦	See Note ⑦	See Note ⑦
	3	3	3	NC	3	3	3	NC
	1	1	1	1	1	1	1	3
		RF800	MWC-1			WC-5	WC-20	
	A	Term #3	Orange Term	2	2	Orange Term	Term #1	2
		RF800	MWC-1			WC-5	WC-20	
	G	Term #4	Black Term	1	8	Black Term	Term #2	1
Lucent Width Coil Across	2 & 1	RF800 Terms #1 & #2 across 3 & 1	MWC-1 Terms Red & Blue across 3 & 1	212R1 across 2 & 1	2 & 1	WC-5 terms Red & Blue across 3 & 1	WC-20 Terms #3 & #4 across 3 & 1	WC-12 Terms Red & Blue across 2 & 1
Special Notes		⑦ ⑧	⑦ ⑧	⑧		⑤ ⑥	⑦ ⑧	⑤ ⑥

⑦ Connect a 47 or 56MMF capacitor from terminal #5 to open end of R107. (Original terminal #3 connection.)
⑧ Connect a 47 or 56MMF capacitor from terminal #7 to open end of R107. (Original terminal #3 connection.)
⑨ Connect a 47 or 56MMF capacitor from terminal "T" to open end of R107. (Original terminal #3 connection.)
⑩ If the picture is out of phase, reverse width coil primary or secondary.
⑪ Jumper terms #8 & "T".

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA AIRLINE Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	Halldorson Part No.	Thordarson Part No.	NOTES
T8	5.1KΩ	3.4Ω	51X368	A-3877	A-3930	S-5X	Z1107	24S81	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA AIRLINE Part No.	REPLACEMENT DATA QUAM Part No.	NOTES
SP1	10"	PM	3.4Ω	12A519	10A31	
	8"	PM	3.4Ω	12A518	8A21	
	6"	PM	3.4Ω	12A516	6A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIRLINE Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L1A	Ant. Coil	0ΩCT	0Ω	9A2329-2				Channel 2
B	Ant. Coil	0ΩCT	0Ω	9A2329-3				Channel 3
C	Ant. Coil	0ΩCT	0Ω	9A2329-4				Channel 4
D	Ant. Coil	0ΩCT	0Ω	9A2329-5				Channel 5
E	Ant. Coil	0ΩCT	0Ω	9A2329-6				Channel 6
F	Ant. Coil	0ΩCT	0Ω	9A2329-7				Channel 7
G	Ant. Coil	0ΩCT	0Ω	9A2329-8				Channel 8
H	Ant. Coil	0ΩCT	0Ω	9A2329-9				Channel 9
I	Ant. Coil	0ΩCT	0Ω	9A2329-10				Channel 10
J	Ant. Coil	0ΩCT	0Ω	9A2329-11				Channel 11
K	Ant. Coil	0ΩCT	0Ω	9A2329-12				Channel 12
L	Ant. Coil	0ΩCT	0Ω	9A2329-13				Channel 13
L2	Mext.Coil	0Ω		31R-727				
L3A	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-2				Channel 2
B	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-3				Channel 3
C	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-4				Channel 4
D	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-5				Channel 5
E	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-6				Channel 6
F	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-7				Channel 7
G	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-8				Channel 8
H	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-9				Channel 9
I	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-10				Channel 10
J	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-11				Channel 11
K	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-12				Channel 12
L	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-13				Channel 13
L4	Fil. Choke	0Ω		34A-704				
L5	Conv. Plate	.1Ω		31R-109				
L6	IF Trap	.1Ω		9A2320				
L7	1st Video IF	.1Ω		9A2316				
L8	2nd Video IF	.2Ω	.2Ω	9A2317				
L9	Fil. Choke	0Ω		9A2033	19-1002	TV-126	6218	Includes 47.25MC trap
L10	3rd Video IF	.2Ω	.2Ω	9A2318		TV-128♦	6233♦	
L11	Parasitic Suppressor	0Ω		9A2322				1 turn wire on 10Ω resistor
L12	Fil. Choke	0Ω		9A2033	19-1002		4606	
L13♦	Cathode Trap	0Ω		9A2321				
L14	4th Video IF	.5Ω	.5Ω	9A2319		TV-125	6234	
L15	Series Peaking Coil	8Ω		36A10	19-4060		6172♦	60 Microhenries; Wound on 22KΩ resistor
L16	Shunt Peaking Coil	18Ω		36A22	19-3300	TV-135	6155	290 Microhenries
L17	4.5MC Trap	.2Ω		9A2074	20-1004	TV-151	1470	
L18	Shunt Peaking Coil	10.5Ω		36A1	19-3100	TV-131	6177	100 Microhenries
L19	Shunt Peaking Coil	10.5Ω		36A25	19-3100♦	TV-181♦	6177♦	100 Microhenries; Wound on 470Ω resistor
L20	Series Peaking Coil	14Ω		36A13	19-4180♦	TV-184♦	6180♦	180 Microhenries; Wound on 22KΩ resistor
L21	Shunt Peaking Coil	14Ω		36A2	19-3180	TV-134	6154	190 Microhenries
L22	1st Sound IF	6.5Ω		9A2301	17-1031♦	TV-13♦	6203♦	
L23	2nd Sound IF	2.6Ω	2.1Ω	9A2323	17-1021	TV-13	6203	
L24	Ratio Det.	4Ω	.65CT	9A2395	17-3497	TV-15	6305	Tertiary winding = .5Ω
L25	Horiz. Osc.	64Ω		9A2096	19-1076	TV-163	6210	

* Deluxe trap.
♦ Parallel with 22KΩ resistor.
▲ Parallel with 470KΩ resistor.
♦ Drill mounting holes.
▲ Use one winding only.

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	AIRLINE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L26	. 250ADC	38. 6Ω	1. 06HY	52X95	C-2326 ①	C-2996 ①	C-23X①	C5037①	26C44

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRLINE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	4/10A 125V	16X147-3	16X146	313. 400 (3AG-4/10A-S/B)	357091	MDL 4/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M2	Dial Light	7A32	#51, Bayonet
M3	Tuner	25A1119	VHF
M4	Trap	31K-225-01	VHF Ant. Input Filter
M5	Focus Magnet	2A438-2	Includes centering device
M6	Ion Trap	2A421	
B2	Trimmer Cap.	17A269	Horizontal Drive (120-400MMF)
	Knob	10A820-1	Fine tuning - Mahogany cabinet
	Knob	10A840-1	Contrast - Mahogany cabinet
	Knob	10A812-1	Channel Selector - Mahogany cabinet
	Knob	10A841-1	On-off-volume -
	Knob	10A820-2	Fine tuning - Oak cabinet
	Knob	10A840-2	Contrast - Oak cabinet
	Knob	10A812-3	Channel Selector - Oak cabinet
	Knob	10A841-2	On-off-volume - Oak cabinet
	Knob	10A826	Red- Secondary controls
	Safety Glass		Specify complete model number when ordering
	Mask		Specify complete model number when ordering

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3024 MEADE ST.
DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V18, V19, V20 and V21. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C83, C82, C84, C81, R102, R103 and other associated components.	Check L25, C77, C78, R97, R95, R94 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, and V22. Check adjustment B2, B3 and B4. Check T3, T5A, R102, R103, R97 and other associated components.

BLOOMING

Check by substitution V19, V20, V21 and V22. Check R109, R102, R103, C84 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6, V7, V8 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

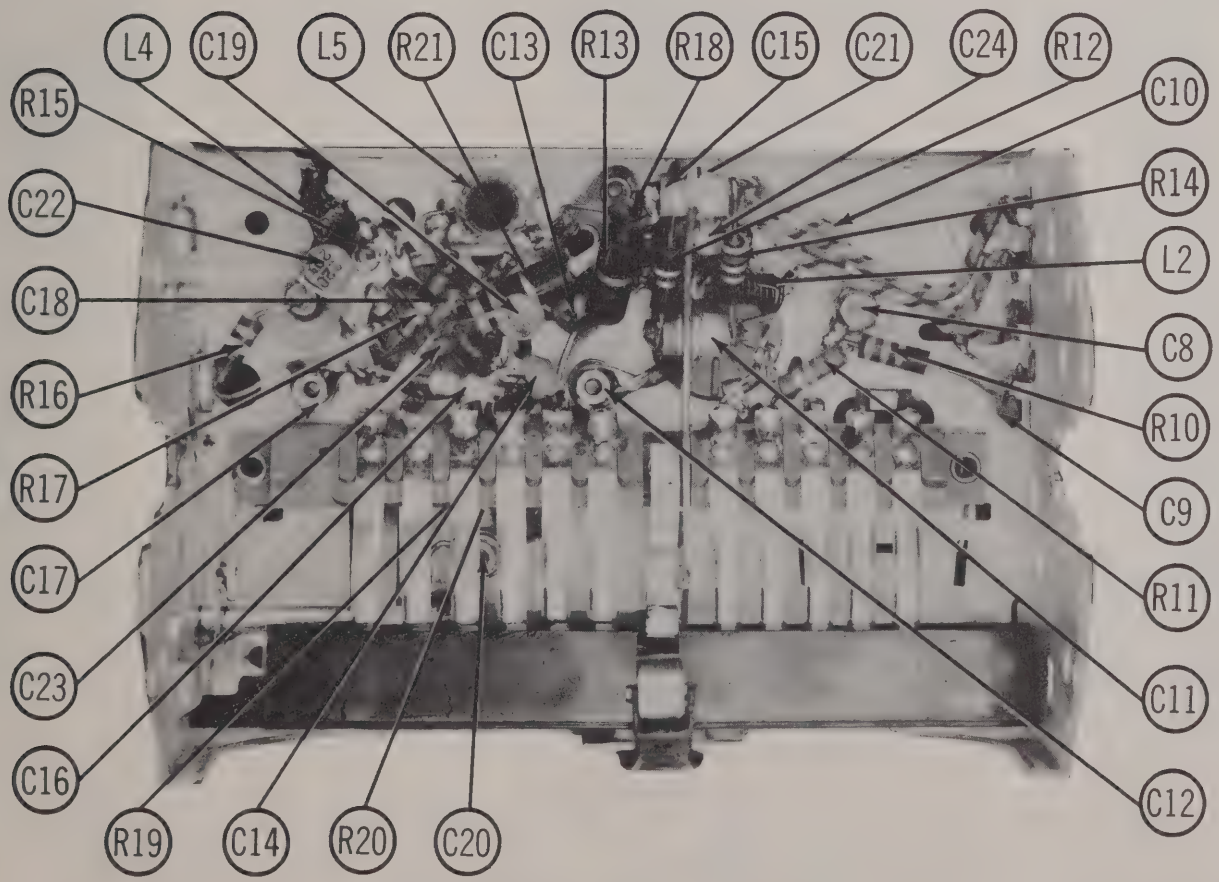
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



TUNER BOTTOM VIEW

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel switch.

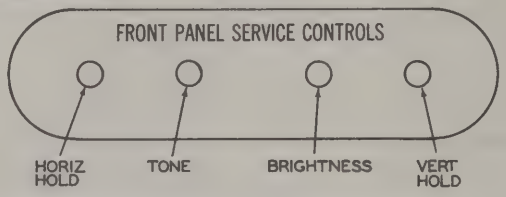
PICTURE TUBE SAFETY GLASS CLEANING

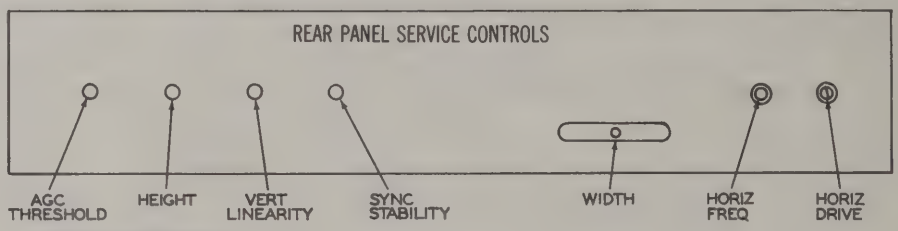
To clean safety glass, remove 5 wood screws holding plastic strip at the top of the safety. Remove plastic strip and safety glass. Use extreme caution when removeing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





SPECIAL ADJUSTMENTS

AGC THRESHOLD - Turn the set on and tune in strongest station in that area. Turn the AGC Threshold Control (R9) clockwise until the picture shows signs of overloading, faded out picture and buzz in sound. Turn R9 counter clockwise from the point where overloading occurs until no sign of overloading is noted.

SYNC STABILITY CONTROL - Turn set on and tune in strongest TV station in that area. Rotate the sync stability control (R6).clockwise until bending is noted near the top of picture. Turn R6 counter clockwise until picture bending disappears.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-range position and adjust the horizontal frequency slug (L25) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz adjust the ratio detector secondary (L24) located on top of chassis (See tube placement chart for location).

FUSES

One fuse is used for LV power supply protection.(For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

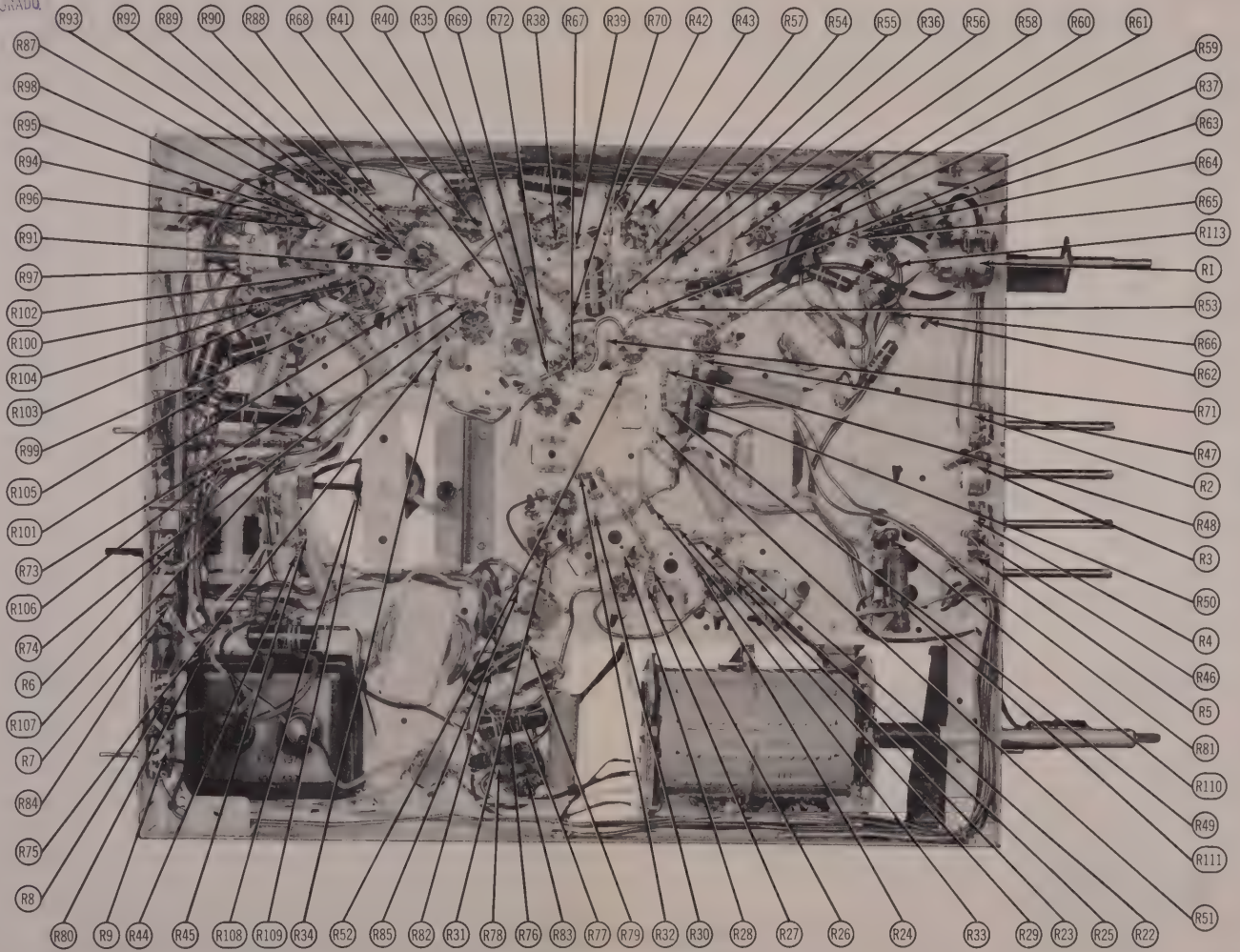
DISASSEMBLY INSTRUCTIONS

1. Remove 4 push-on type control knobs from front panel of cabinet.
2. Remove 4 metal screws. Remove rear cover.
3. Remove 2 metal screws from antenna leads.
4. Disconnect 2 antenna leads.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

PICTURE TUBE REMOVAL

1. Remove 1 metal screw from front tube mounting band.
2. Remove picture tube socket and HV lead and ion trap.
3. Remove picture tube.

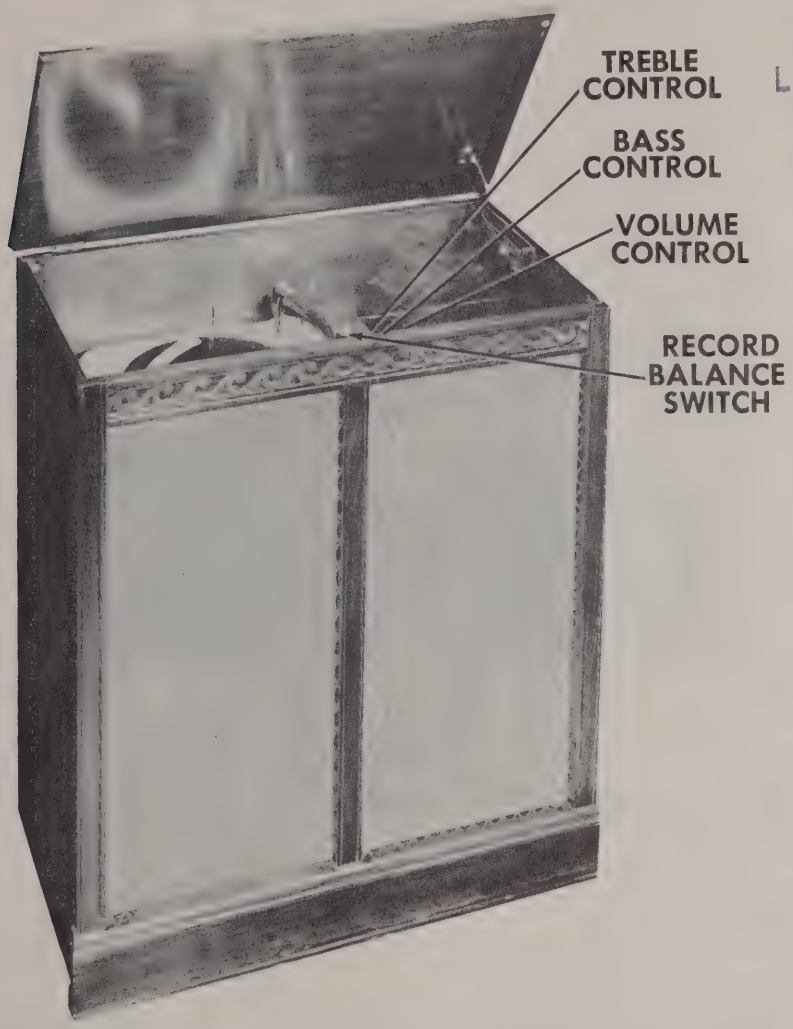
PROPERTY OF
L. F. [illegible] SHIP
[illegible]
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. [illegible]
3924 [illegible]
DENVER, COL[illegible]

CAPEHART MODELS
4PH55B, M, 16PH55B, F, M (Ch. CA-156)



CAPEHART MODELS
4PH55B, M, 16PH55B, F, M (Ch. CA-156)

TRADE NAME	Capehart Models 4PH55B, M, 16PH55B, F, M (Ch. CA-156)
MANUFACTURER	Capehart-Farnsworth Co., Fort Wayne, Ind.
TYPE SET	AC Operated 10 Watt Audio amplifier With 3 Speed Automatic Record Changer
TUBES (Five)	Types 12AX7 AF Amp., 12AX7 AF Amp.-Phase Inverter, (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles RATING .5 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER #345A - SEE SIMILAR V-M MODEL 950 - PHOTOFACT SET #216 — FOLDER 11 OR RECORD CHANGER MANUAL CM-5.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

CAPEHART
MODEL 4PH55B (Ch.CA-156)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CAPEHART PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amplifier	12AX7	12AX7	9A	
V2	AF Amplifier-Phase Inverter	12AX7	12AX7	9A	
V3	Audio Output	6V6GT	6V6GT	7S	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CAPEHART PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.
C1A	▲30	450	750090B-43			FP444.5	TM-4048	Q-050
B	■20	450						
C	▲20	450						
D	10	450						
C2A	20	450	750381A-7			TC75	TD-20-450	FMT-337
B	25	25				TC26	TD-25-25	
C3	.01	600	2248-1030	D6-103	GP2-333-103	PT611	IMP6-S1	330611
C4	.1	600	2248-1040	DF-104		PT601	IMP6-P1	330601
C5	.0047	600	2248-4720	D6-472	GP2-333-472	PT6247	IMP6-D47	3306247
C6	100	500	750272A-11	D6-101	GP1K-101	MC235		K-1310
C7	.001	600	2248-1020	D6-102	GP2L-102	PT621	IMP6-D1	330621
C8	.01	600	2248-1030	D6-103	GP2-333-103	PT611	IMP6-S1	330611
C9	.022	200	2246-2230	DF-203	817-02	PT4122	IMP4-S22	3304122
C10	.01	600	2248-1030	D6-103	GP2-333-103	PT611	IMP6-S1	330611
C11	330	500	650162A-9	D6-331	GP2K-331	UC-5333		K-1333
C12	.047	600	2248-4730	DF-503		PT6147	IMP6-S47	3306147
C13	.047	600	2248-4730	DF-503		PT6147	IMP6-S47	3306147
C14	.047	600	2248-4730	DF-503		PT6147	IMP6-S47	3306147
C15	.01	600	2248-1030	D6-103	GP2-333-103	PT611	IMP6-S1	330611
C16	.01	600	2248-1030	D6-103	GP2-333-103	PT611	IMP6-S1	330611
C17	4.0	50	650663A-3					
C18	5000	1500	453521A-1					

CONTROLS

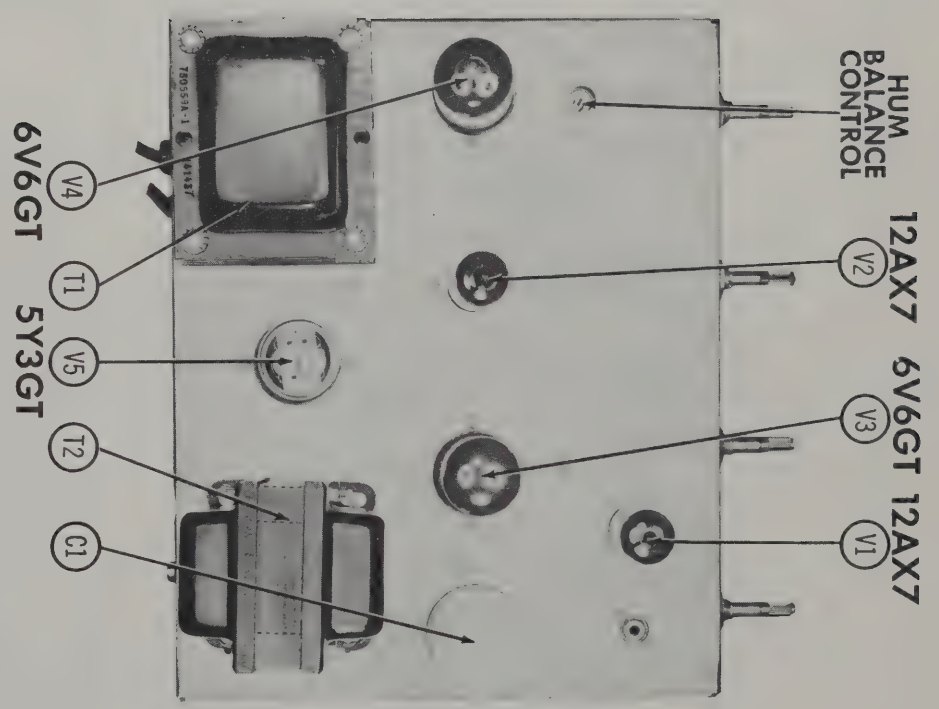
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CAPEHART PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.2Meg	½	750266A-12	Q13-140	A47-4Meg-Z	AB-85	U-57	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	1.5Meg	½	750266A-13		A47-2Meg-Z	AB-70	U-155	Bass
B	Shaft		Not Req.		KSS-3	AK-4	Not Req.	Attach to R2A
R3A	1.5Meg	½	750266A-15	Q11-138	A47-1.5Meg-S	AB-744	U-155	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4	100Ω	1	650042-A-9					Hum Balance -wire wound

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CAPEHART PART No.	IRC PART No.	NOTES
R5	2.2Meg	½	3229-225	BTS-2.2Meg	
R6	330KΩ	½	3230-334	BTS-330K	
R7	2200Ω	½	3229-222	BTS-2200	
R8	330KΩ	½	3230-334	BTS-330K	
R9	3900Ω 5%	1½	3228-392	BTS-3900 5%	
R10	100KΩ	½	3230-104	BTS-100K	
R11	15KΩ	½	3229-153	BTS-15K	
R12	220KΩ	½	3229-224	BTS-220K	
R13	15KΩ	½	3229-153	BTS-15K	
R14	150KΩ	½	3229-154	BTS-150K	
R15	2700Ω 5%	1½	3228-272	BTS-2700 5%	
R16	47KΩ	½	3230-473	BTS-47K	
R17	100KΩ	½	3230-104	BTS-100K	
R18	470KΩ	½	3228-474	BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CAPEHART PART No.	IRC PART No.	NOTES
R19	3900Ω 5%	½	3228-392	BTS-3900 5%	
R20	220KΩ	½	3229-224	BTS-220K	
R21	470KΩ	½	3228-474	BTS-470K	
R22	3900Ω 5%	½	3228-392	BTS-3900 5%	
R23	470KΩ 5%	½	3228-474	BTS-470K 5%	
R24	470KΩ 5%	½	3228-474	BTS-470K 5%	
R25	220KΩ	½	3229-224	BTS-220K	
R26	470KΩ	½	3228-474	BTS-470K	
R27	270Ω 5%	2	3234-271		
R28	3900Ω	1	3232-392	BTA-3900	
R29	470KΩ	½	3228-474	BTS-470K	
R30	3900Ω	1	3232-392	BTA-3900	
R31	3900Ω 5%	½	3228-392	BTS-3900 5%	
R32A	1000Ω	5	750288A8		
B	400Ω	5			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	CAPEHART PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .50A	600VCT .070ADC	5VAC @2A	6.3VAC @.38A SEC. 4 6.3VAC @1.2A	750559A-1					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CAPEHART PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7.2KΩ CT	4.76Ω	750503A-2	Z1405 ②			22S93 ① ②		① Drill new mounting holes. ② Tape extra taps on secondary

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CAPEHART PART No.	QUAM PART No.	
SP1	12"	PM	7.5Ω	850123A-6	12A10X	
SP2	12"	PM	7.7Ω	850315A-1		
SP3	5"	PM	3.3Ω	850275A-2		
SP4	5"	PM	3.3Ω	850275A-2		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	CAPEHART PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		55-T	GD-J	47	0-1 or S-1 & 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

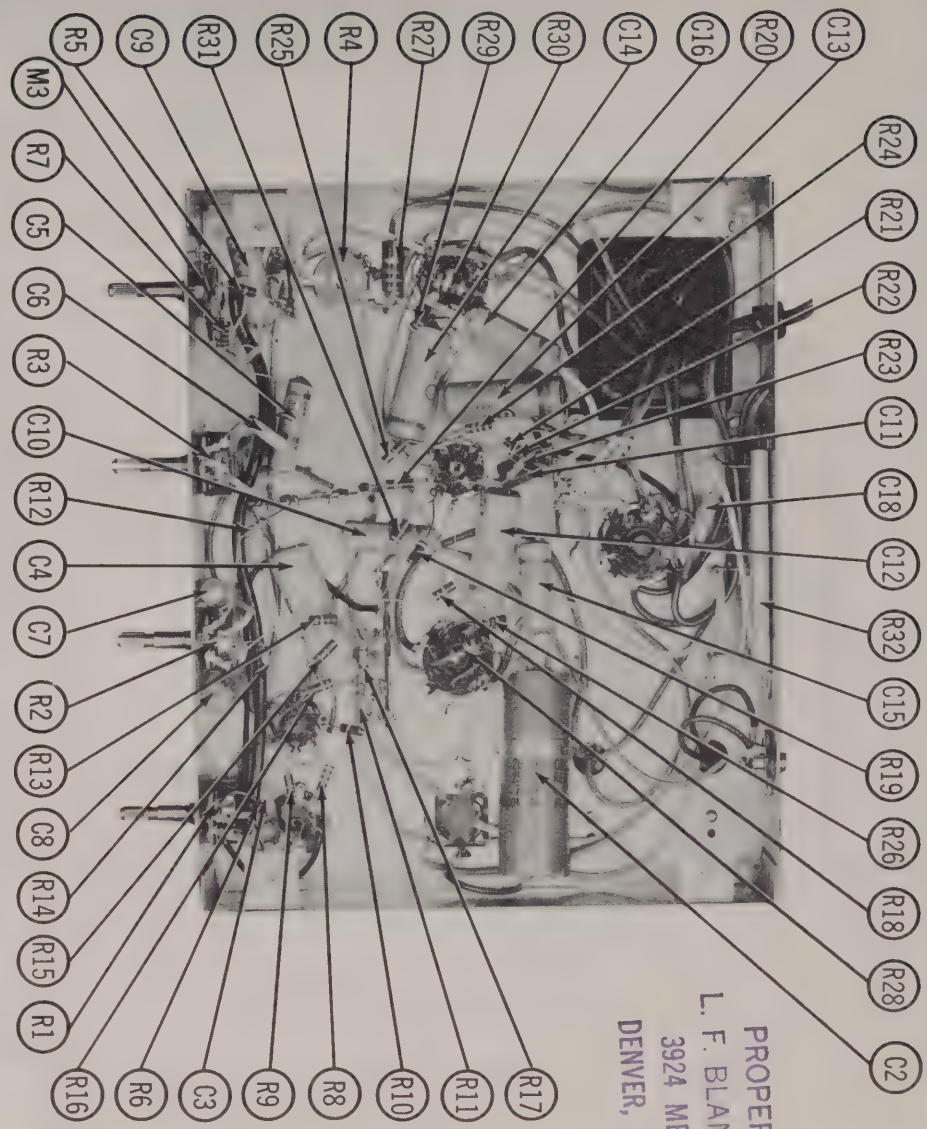
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	CAPEHART PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		*S-67 or †S-66 or ♦†S-66SD or ♦S-66D	†AC-434 or ♦†AC-434D1 or †♦AC-434D2 or ♦AC-434D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	CAPEHART PART No.	NOTES
M3	Switch Knob	453837A-1 650854A-6	Record Balance - (Rotary - wafer type) Control (4 used)

CHASSIS—BOTTOM VIEW



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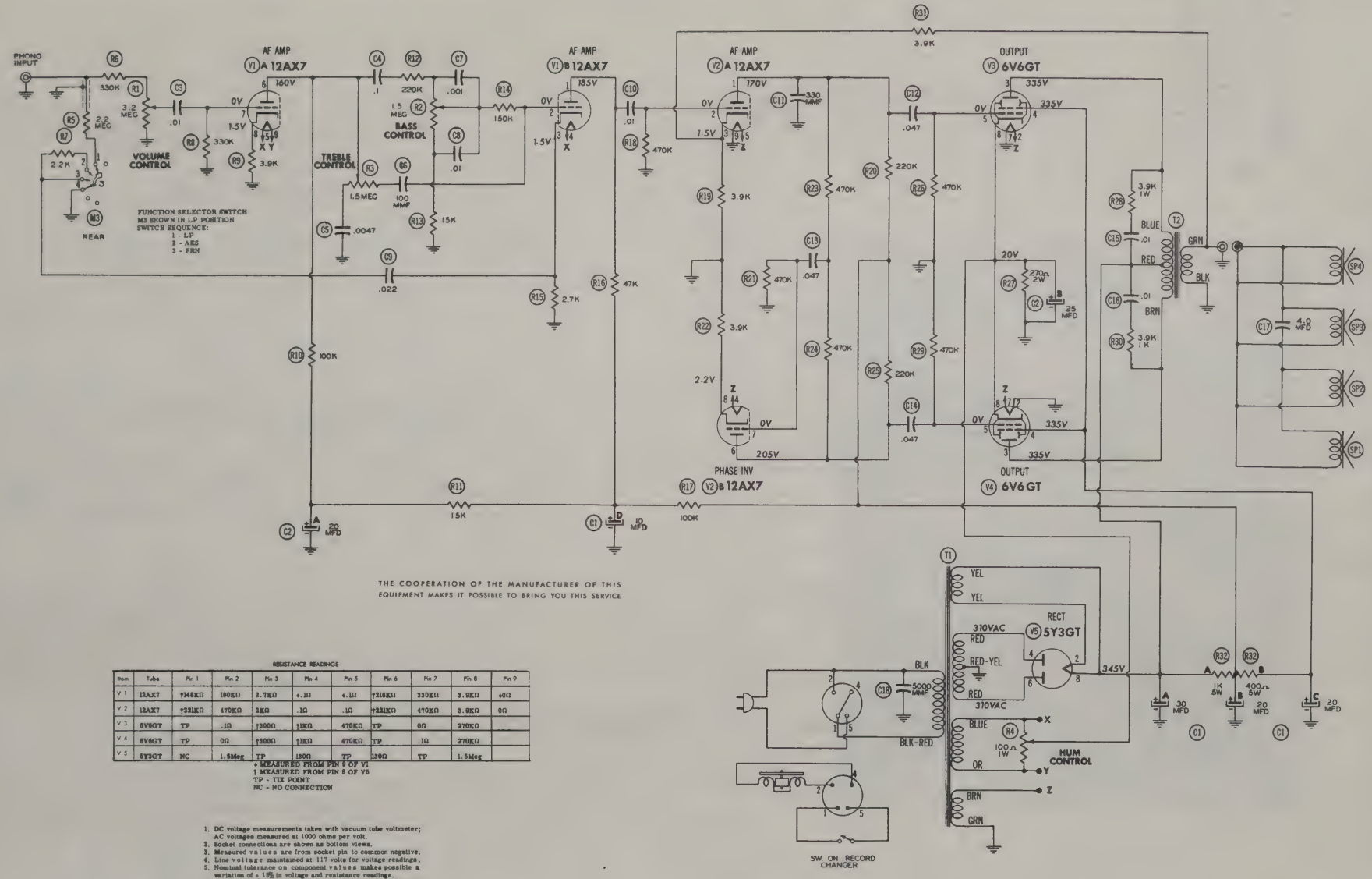
DENVER, COLORADO

CAPEHART
MODEL 4PH55B (Ch. CA-156)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†148KΩ	180KΩ	2.7KΩ	∘.1Ω	∘.1Ω	†216KΩ	330KΩ	3.9KΩ	∘0Ω
V 2	12AX7	†321KΩ	470KΩ	2KΩ	.1Ω	.1Ω	†221KΩ	470KΩ	3.9KΩ	0Ω
V 3	6V6GT	TP	.1Ω	†300Ω	†1KΩ	470KΩ	TP	0Ω	270KΩ	
V 4	6V6GT	TP	0Ω	†300Ω	†1KΩ	470KΩ	TP	.1Ω	270KΩ	
V 5	5Y3GT	NC	1.5Meg	TP	130Ω	TP	130Ω	TP	1.5Meg	

∘ MEASURED FROM PIN 8 OF V1
† MEASURED FROM PIN 8 OF V5
TP - TIE POINT
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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3924 MEADE ST.
DENVER, COLORADO

CHEVROLET
MODEL 987087

TRADE NAME	Chevrolet Model 987087 (For 1955 Chevrolet Cars)
SUPPLIER	Chevrolet Motor Div., General Motors Corp., Detroit, Mich.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Seven)	Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12BF6 Det-AVC-AF Amp., (2) 6V6GT Output, 0Z4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 3.0 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Tone control to mid-position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400~ Mod)	High frequency end of dial.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	82MMFD	Thru dummy to antenna receptacle. Low side to chassis.	1615KC	"	"	A5, A6, A7	Preset A8 (osc. core) so that rear of core is 1 25/32" from mounting end of coil form. Adjust A5, A6 & A7 in order given for maximum output.
3.	"	"	1000KC	Tune to 1000KC signal.	"	A9, A10	Adjust for maximum output.
4.	"	"	1615KC	High frequency end of dial.	"	A6, A7	"
5.	"	"	900KC	Tune to 900KC signal.	"		If necessary, adjust dial pointer to read 900KC. With receiver installed in car and antenna fully extended, tune to a weak signal between 600KC and 1000KC. Adjust A7 for maximum output.

PUSHBUTTON SETTING

Pull push button to the right and out. Tune in desired station manually. Push button all the way in.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CHEVROLET PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amp.	12BA6	12BA6	7BK	
V4	Det-AVC-AF Amp.	12BF6	12BF6	7BT	
V5	Audio Output	12V6GT	12V6GT	7S	
V6	Audio Output	12V6GT	12V6GT	7S	
V7	Rectifier	0Z4	0Z4	4R	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CHEVROLET PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■20	400	M-908			FP345. 8	TM-3036	T-550	
B	▲20	400							
C	20	25							
C2	.05	200	6512	DF-503		PT415	IMP2-S5	330215	
C3	15	500	G-150	D6-150	GP1K-150	UC-5415		K-1415	
C4	39		G-390						
C5	180		7257424						
C6	.05	400	6512	DF-503		PT415	IMP4-S5	330415	
C7	10	500	G-100	D6-100	GP1K-100	MC215		K-1410	
C8	.002	600	6582	D6-202	GP2-333-202	PT622	IMP6-D2	330622	
C9	220	500	G-221	D6-221	GP2K-221	UC-5322		K-1322	
C10	.003	600	6529	D6-302	GP2-333-302	PT623	IMP6-D3	330623	
C11	.01	400	6533	D6-103	GP2-333-103	PT411	IMP4-S1	330411	
C12	.1	400	6513	DF-104		PT401	IMP4-P1	330401	
C13	100		G-101	D6-101	GP1K-101	UC-531		K-1310	
C14	.003	1000	H-302	DD-302	1R5KV-332	PT1623	CT10-D3	2110-. 003	
C15	.007	1600	H-702	DD16-702		PT1627	CT16-D7	2116-. 007	
C16	.47	100	7257906			RF480	85LPT2-P5		
C17	.47	100	7257906			RF480	85LPT2-P5		Note 1

Note 1: Some versions use . 47MFD in this application. (Part no. 6592)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CHEVROLET PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	7265265			F1-68	UF26A	Tone - Panel
B	300KΩ	½				R2-45	UR354-T74 †	Volume tapped at 90KΩ - Rear
C	Bushing					AK-27	EB-214	Attach to R1A
D	Switch					KB-7	US-27	Attach to R1B
R2	800Ω with 150Ω stop	1	7262838		39-800-50			Sensitivity (Wire wound) - Note

Note: Connect a 100Ω resistor in series with the lead connecting to the control.
† Universal replacement (Mallory exact duplicate part no. UE1770S)

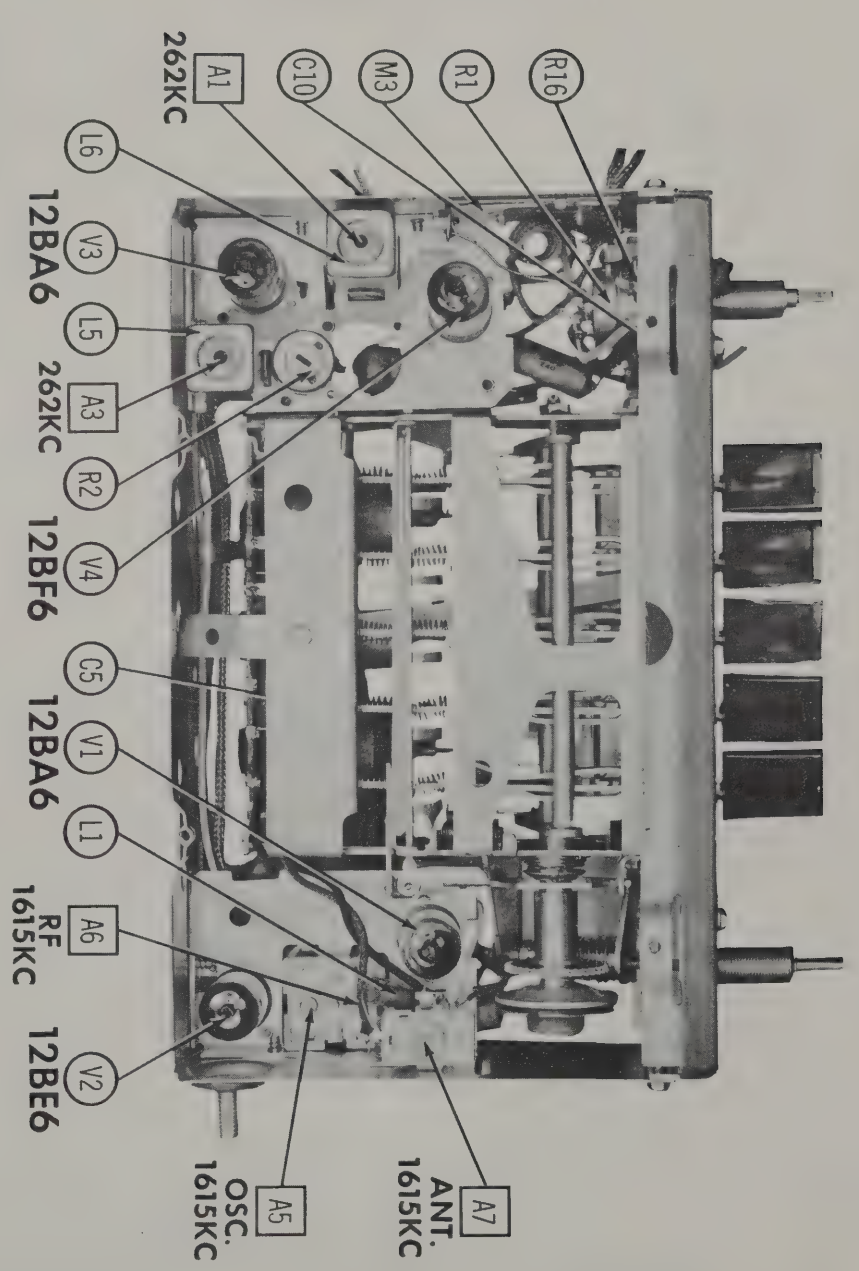
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CHEVROLET PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	2. 2Meg	½	1239	BTS-2. 2Meg	
R4	68Ω	½	1111	BTS-68	
R5	15KΩ	2	1277	BTB-15K	
R6	15KΩ	1	1253	BTA-15K	
R7	22KΩ	½	1215	BTS-22K	
R8	330KΩ	½	1229	BTS-330K	
R9	1Meg	½	1235	BTS-1Meg	
R10	1Meg	½	1235	BTS-1Meg	
R11	47KΩ	½	1219	BTS-47K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CHEVROLET PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R12	1Meg	½	1235	BTS-1Meg	
R13	1800Ω	½		BTS-1800	
R14	2200Ω	½	1129	BTS-2200	
R15	820KΩ	½	1254	BTS-820K	
R16	82KΩ	½	1222	BTS-82K	
R17	27KΩ	1	1256	BTA-27K	
R18	360Ω 5%	1	7234563	BTA-360 5%	
R19	1800Ω	2		BTB-1800	Note 1
R20	15KΩ	1	1253	BTA-15K	

Note 1. When replacing mfg. recommends replacing with two resistors, one 2700Ω 2 watt resistor and one 5600Ω 1 watt resistor.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	CHEVROLET PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12VCT @1.8A	384VCT 062ADC			6067	V-3902	P-2861	P-6489		

TRANSFORMER (DRIVER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	CHEVROLET PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	1.8KΩCT RES.				6061					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CHEVROLET PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	7.9KΩ CT	3.3Ω	6063	Z1002 ①	A-2936①	A-3852①	22S56①	S-15X ①	① Fabricate mounting.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CHEVROLET PART No.	QUAM PART No.	
SP1	6" X 9"	PM	3.3Ω	6112	69A3	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CHEVROLET PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Loading Coil	.6Ω		7255738	19-1005		4612	9 Microhenries
L2	Ant. Coil	9.5Ω		7258914				
L3	RF Coil	9.5Ω		7258914				
L4	Osc. Coil	1Ω	4.2Ω	7258911				
L5	Input IF	28Ω	28Ω	1218725	16-6752	BC-350	12-H1	
L6	Output IF	30Ω	30Ω	1218726	16-6754	BC-354	12-H6	
L7	Fil. Choke	0Ω		1217846	19-1001		4604	1.4 Microhenries
L8	Vib. Hash Choke	.1Ω		7265389				42 Microhenries

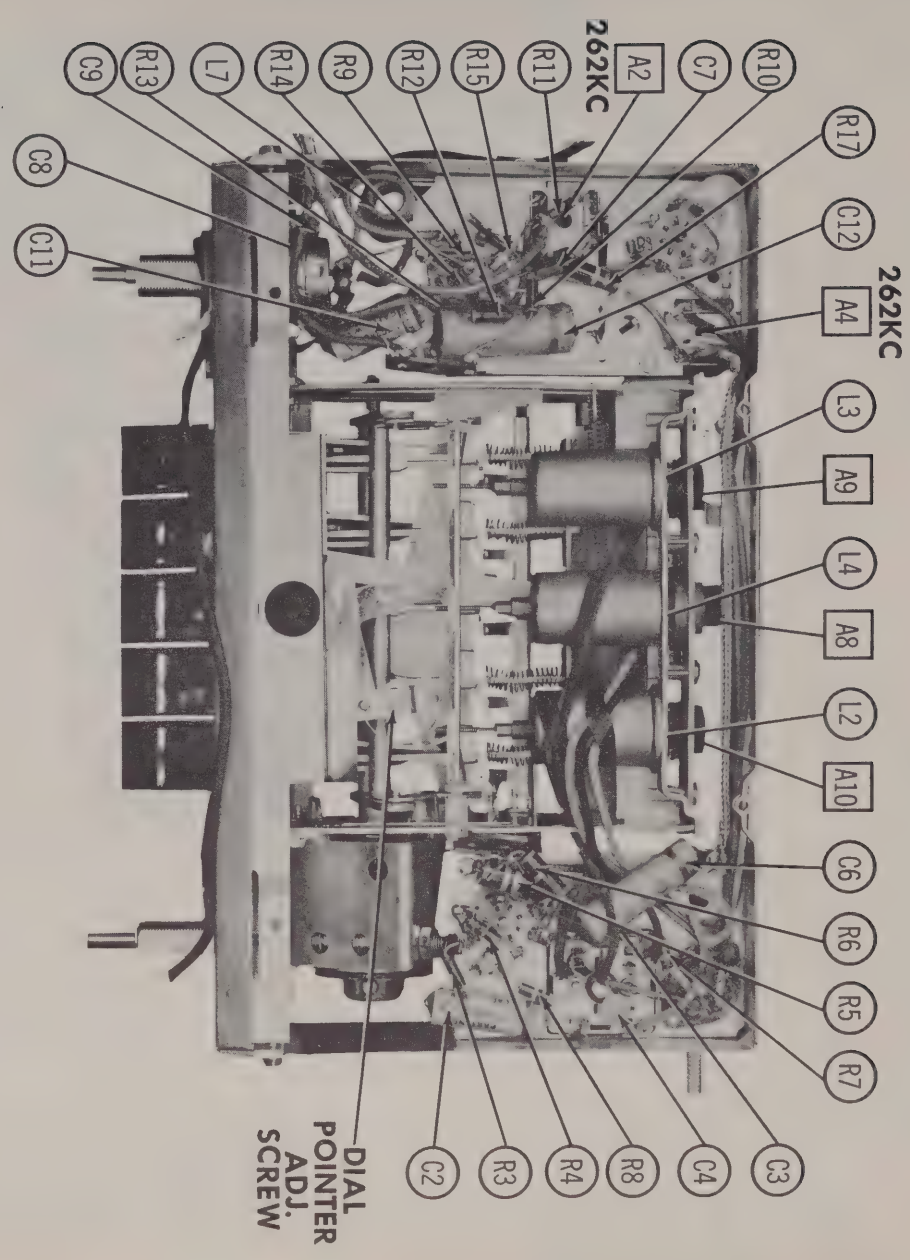
VIBRATOR

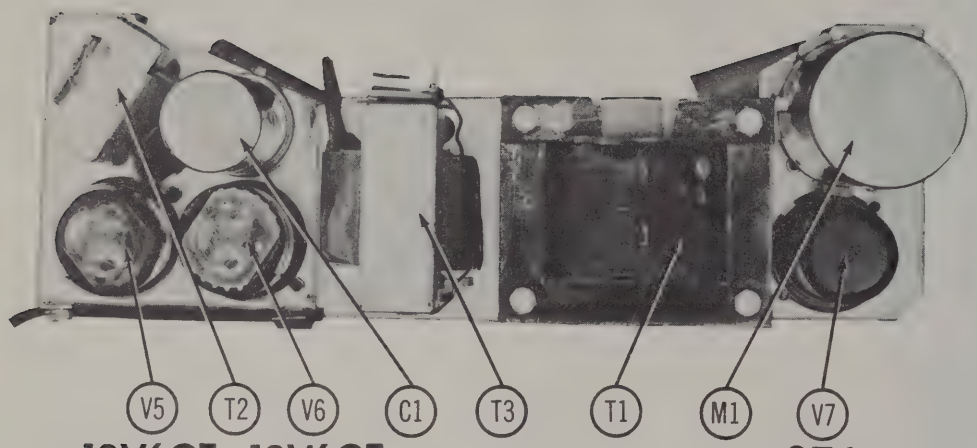
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				CHEVROLET PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12V	155~	8550	6330	G874/G883	6330	

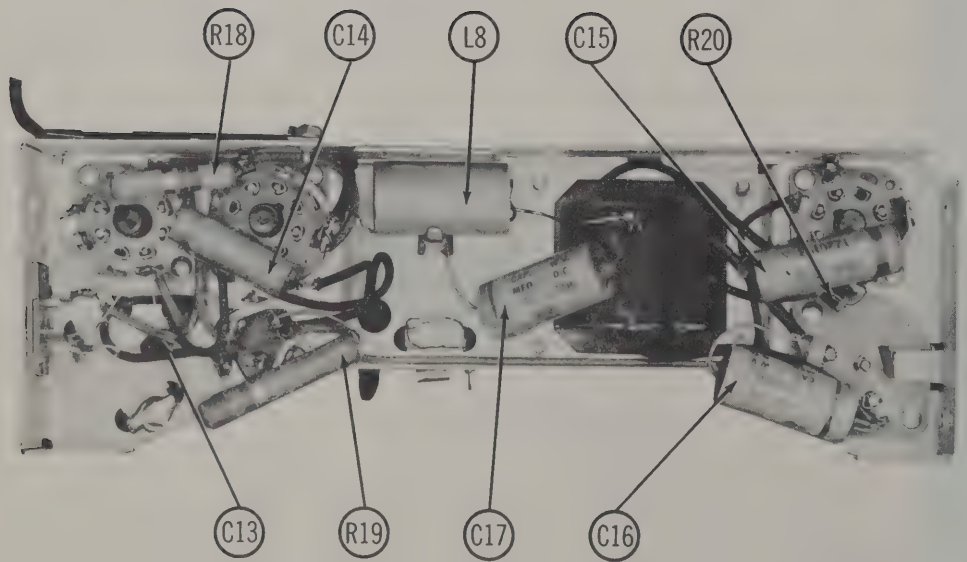
MISCELLANEOUS

ITEM No.	PART NAME	CHEVROLET PART No.	NOTES
M2	Dial Light		#57, Bayonet
M3	Spark Plate	1220682	
A5,A6	Trimmer Cap.	7242454	Dial (4 Section) Osc. & RF Trimmer
A7	Trimmer Cap.	7265255	Ant. Trimmer (2 Section)
	Knob	1990777	On-Off-Volume & Tuning
	Knob	7265132	Tone
	Knob	7265149	Dummy
	Push Button & Slide Assembly	1220667	
	Pointer Backplate	7265257	
	Pointer Tip	1220666	
	Escutcheon Ass'y.	7265266	Includes Dial Glass
	Core Guide Bar	7262462	
	Pointer Mechanism Assembly	1220665	

CHASSIS—BOTTOM VIEW




V5
T2
V6
C1
T3
T1
M1
V7
12V6GT
12V6GT
0Z4


R18
C14
L8
C15
R20
C13
R19
C17
C16

L. F. [illegible] RADIO
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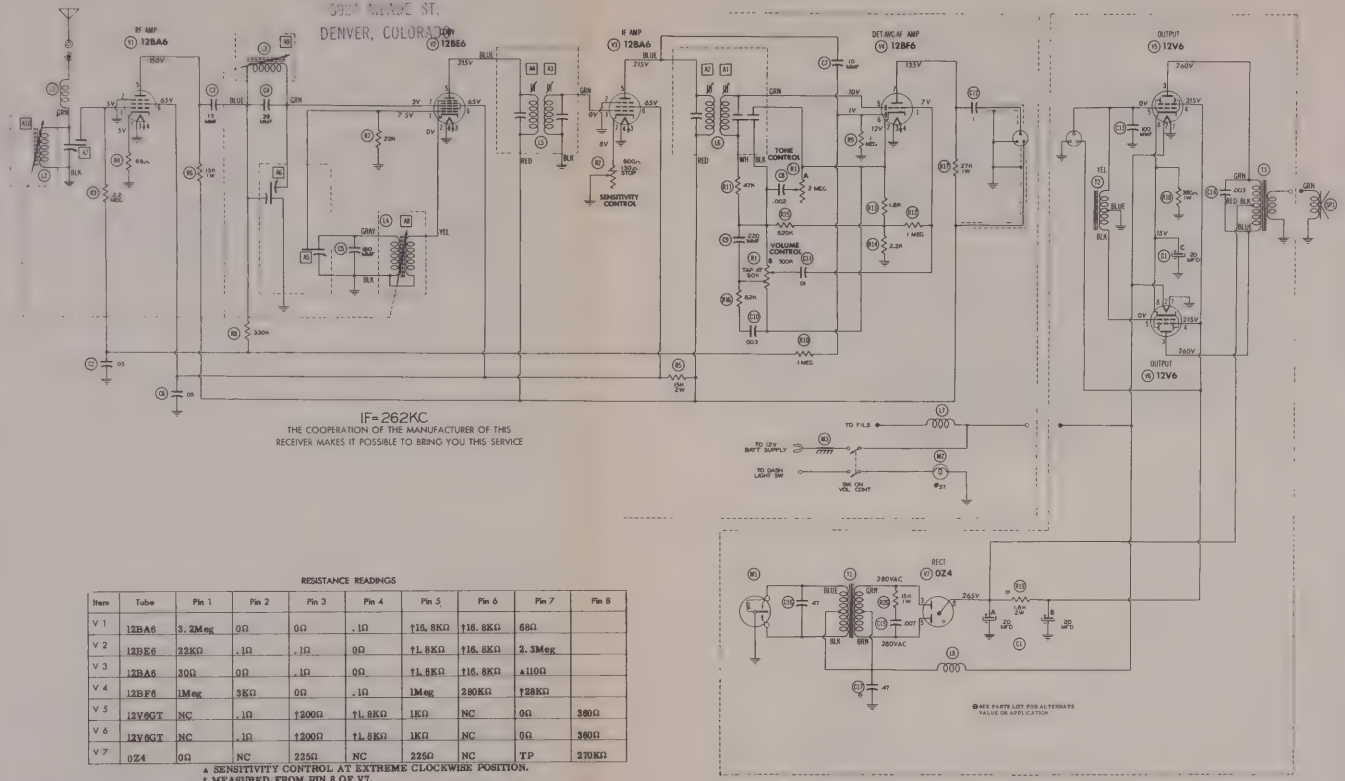

IF=262KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BA6	3.2Meg	0Ω	0Ω	.1Ω	†16.8KΩ	†16.8KΩ	68Ω	
V 2	12BE6	22KΩ	.1Ω	.1Ω	0Ω	†1.8KΩ	†16.8KΩ	2.3Meg	
V 3	12BA6	30Ω	0Ω	.1Ω	0Ω	†1.8KΩ	†16.8KΩ	▲110Ω	
V 4	12BF6	1Meg	3KΩ	0Ω	.1Ω	1Meg	280KΩ	†28KΩ	
V 5	12V6GT	NC	.1Ω	†200Ω	†1.8KΩ	1KΩ	NC	0Ω	360Ω
V 6	12V6GT	NC	.1Ω	†200Ω	†1.8KΩ	1KΩ	NC	0Ω	360Ω
V 7	0Z4	0Ω	NC	225Ω	NC	225Ω	NC	TP	270KΩ

▲ SENSITIVITY CONTROL AT EXTREME CLOCKWISE POSITION.
† MEASURED FROM PIN 8 OF V7.
NC - NO CONNECTION
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Resistance measurements made with power supply disconnected.
4. Receiver voltages measured at 115 volts for voltage readings.
5. Readings fluctuate as components in case malfunction or a variation of ± 10% in voltage and resistance readings.
6. Values marked ▲ unstable, no signal applied for voltage measurements.

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HALLICRAFTERS
MODELS TW-55 & B-55 (Run 1)

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L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HALLICRAFTERS
MODELS TW-55 & B-55 (Run 1)

TRADE NAME	Hallicrafters Model TW-55 and Optional Power Supply Model B-55
MANUFACTURER	The Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.
TYPE SET	Battery Operated Portable AM Superheterodyne Receiver With Optional AC Power Supply
TUBES (Four)	Types 1R5 Conv., 1T4 IF Amp., 1S5 Det-AVC-AF Amp., 3V4 Output
POWER SUPPLY RATING	1.5 Volts "A" Supply & 45 Volts "B" Supply (110-120 Volts AC With Optional Power Supply B-55) 200MA @ 1.5Volts DC & 6.5MA @ 45Volts DC (or) .05 Amp. @ 117Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power when available.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to osc. stator terminal lug. Low side to chassis.	460KC (400~ Mod)	Set tuning gang to approximate mid-range.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
*2.		Loop (Radiated)	1240KC	Highest freq. CD emblem on dial.	"	A5, A6	"

* Before proceeding with step 2, place chassis in cabinet and connect antenna. A5 and A6 are accessible thru small slide panel opposite tuning gang.

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PARTS LIST AND DESCRIPTIONS

HALLICRAFTERS
MODEL TW-55

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Hallicrafters PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1T4	1T4	6AR	
V3	Det-AVC-AF Amp.	1S5	1S5	6AU	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	Hallicrafters PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1	16	165	45A311					MT-1516	
C2	10	110	121A962						
C3	250	15	45A310				TD-250-15		
C4	.05	375	121A969	DF-503					
C5	50		121A971	D6-500	831-500	UC-545		K-1450	
C6	1000		121A970	DD-102	811-102	DC521		K-1210	
C7	2500		121A1000	D6-252		UC-5225			
C8	5			D6-050	831-050	ZT-555		K-1550	
C9	100		121A968	D6-101	801-101	UC-531		K-1310	
C10	500		121A967	D6-501	811-501	UC-535		K-1350	
C11	100		121A968	D6-101	801-101	UC-531		K-1310	
C12	.05	375	121A966	DF-503					
C13	500		121A967	D6-501	811-501	UC-535		K-1350	
C14	1000		121A1001	D6-102	811-102	DC-521		K-1210	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	1Meg	½	25A1154					Volume

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R2	100KΩ	½	23X20X104K	BTS-100K	
R3	10Meg	½	23X20X106K	BTS-10Meg	
R4	100KΩ	½	23X20X104K	BTS-100K	
R5	3Meg	½	23X20X335K	BTS-3.3Meg	
R6	10Meg	½	23X20X106K	BTS-10Meg	
R7	5Meg	½	23X20X475K	BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R8	1Meg	½	23X20X105K	BTS-1Meg	
R9	2Meg	½	23X20X225K	BTS-2.2Meg	
R10	510Ω	½	23X20X501K	BTS-470	
R11	25Ω	1	24Z1047		
R12	2000Ω	1½	23X20X222K	BTS-2200	
R13	2000Ω	1½	23X20X222K	BTS-2200	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Hallicrafters PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC Ⓟ .05A	65VAC .0044A	7VCT .200A		52A361					

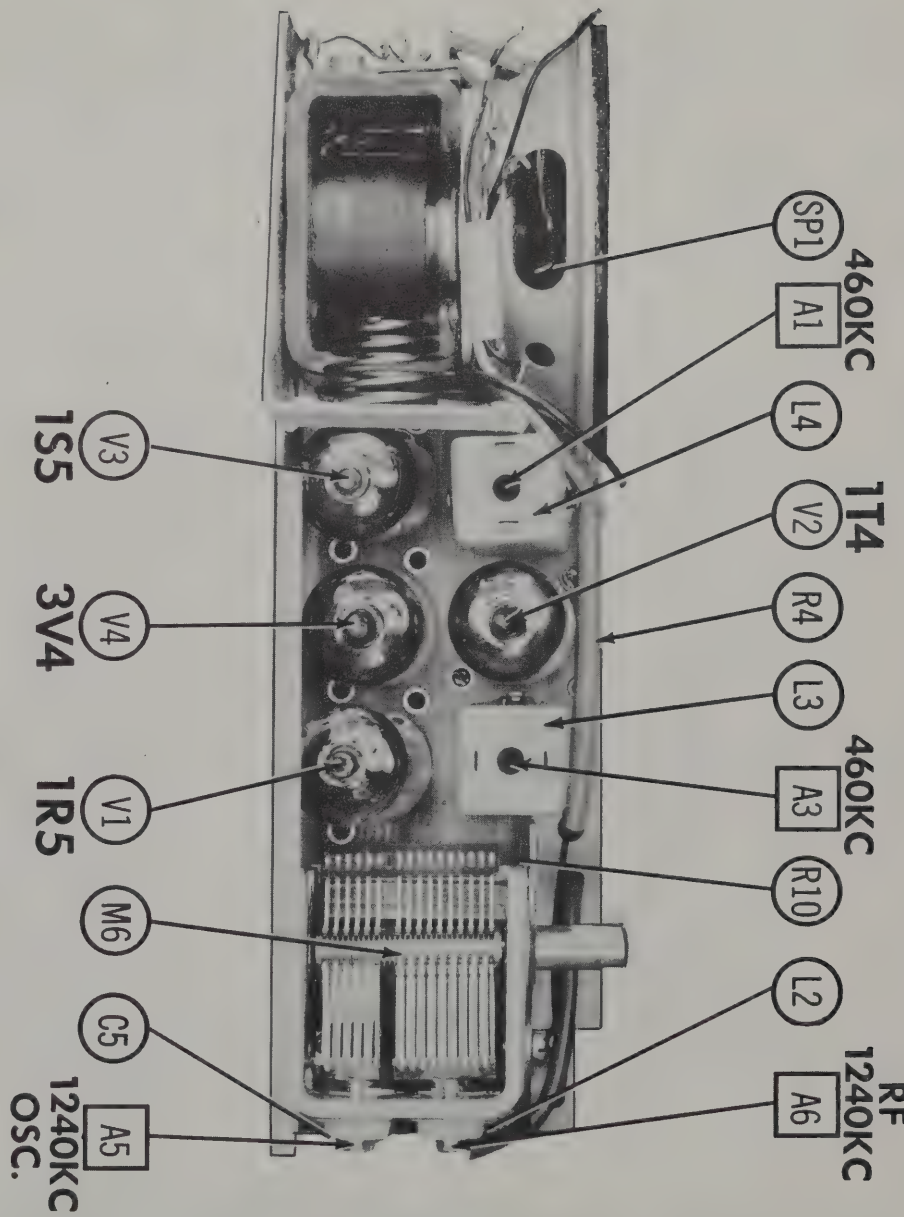
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Hallicrafters PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9.8KΩ	5Ω	121A957						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Hallicrafters PART No.	QUAM PART No.	
SP1	2½"	PM	5Ω	85-179		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	1Ω		121A961				
L2	Osc. Coil	.5Ω	1.8Ω	121A960	14-1074			
L3	Input IF	17Ω	19Ω	121A959	16-6760		10-C1	
L4	Output IF	20Ω	20Ω	121A958	16-6801		10-C2	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA: Hallicrafters PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.200ADC	27A216	1306	D4369				
M2	.0044ADC	27A215		3V1			73	

FUSES

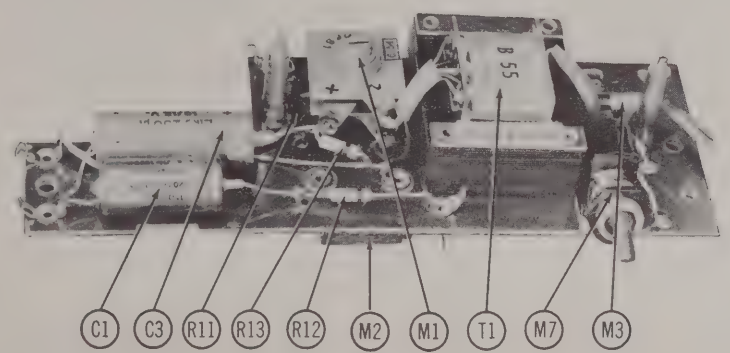
ITEM No.	TYPE	RATING	REPLACEMENT DATA: Hallicrafters PART No. FUSE	Hallicrafters PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3		100MA	39A413					

BATTERIES

ITEM No.	VOLTAGE	Hallicrafters PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M4	1.5V "A"		950			2R			
M5	45V "B"			415			U30		Connect 2 in parallel.

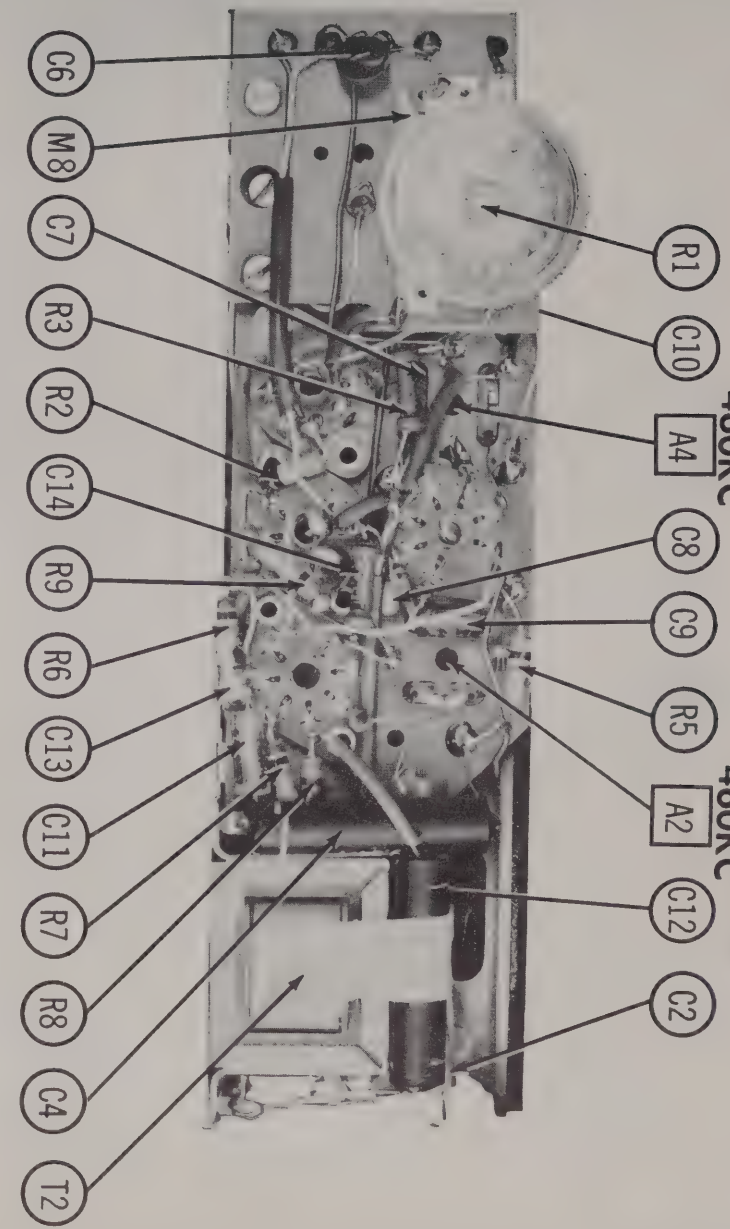
MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M6	Tuning Cap.	121A972	2 Gang (23-335MMF;14-140MMF)
M7	Switch	60A701	On-Off (AC Power Supply) Model B-55
M8	Switch	60-700	On-Off (Receiver) Model TW-55
	Cabinet	116-059	Less Front Panel - Model TW-55
	Cabinet	166-060	Less Handle, Antenna Stirrup & Handle Rings - Model TW-55
	Cabinet	116-064	Base - Model B-55
	Front Panel	8B2702	Cabinet - Model TW-55
	Handle	30-336	Model TW-55
	Handle	121A948	Ring - Model TW-55
	Knob	15-831	Tuning
	Knob	15-832	Volume



MODEL B-55-BOTTOM VIEW

CHASSIS—BOTTOM VIEW



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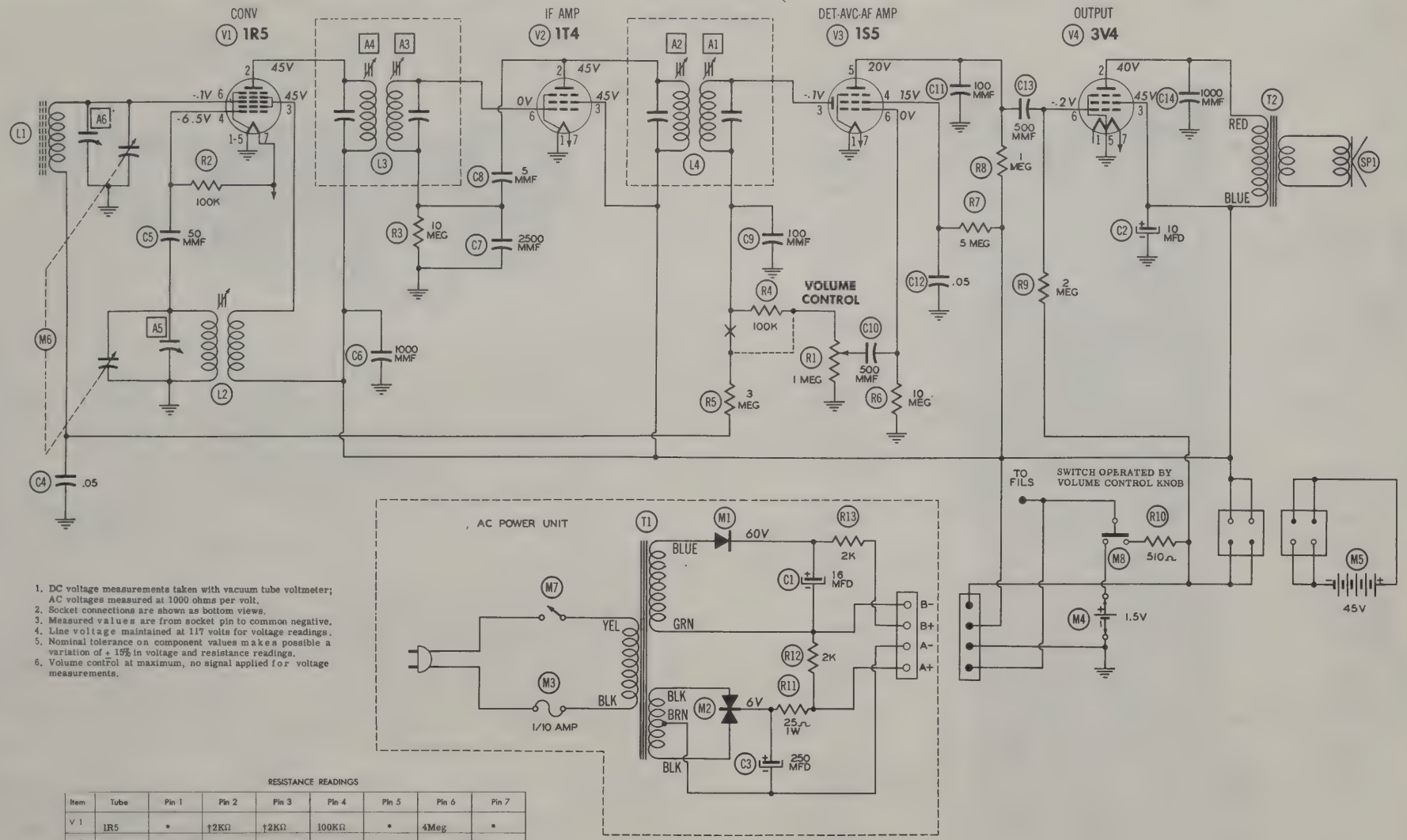

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	•	†2KΩ	†2KΩ	100KΩ	•	4Meg	•
V 2	1T4	•	†2KΩ	†2KΩ	NC	•	10Meg	•
V 3	1S5	•	NC	1Meg	†5Meg	†1Meg	10Meg	•
V 4	3V4	•	†2.4KΩ	†2KΩ	TP	•	2Meg	•

• DO NOT MEASURE OHMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM POSITIVE TERMINAL OF C1.
TP - TIE POINT
NC - NO CONNECTION

IF= 460KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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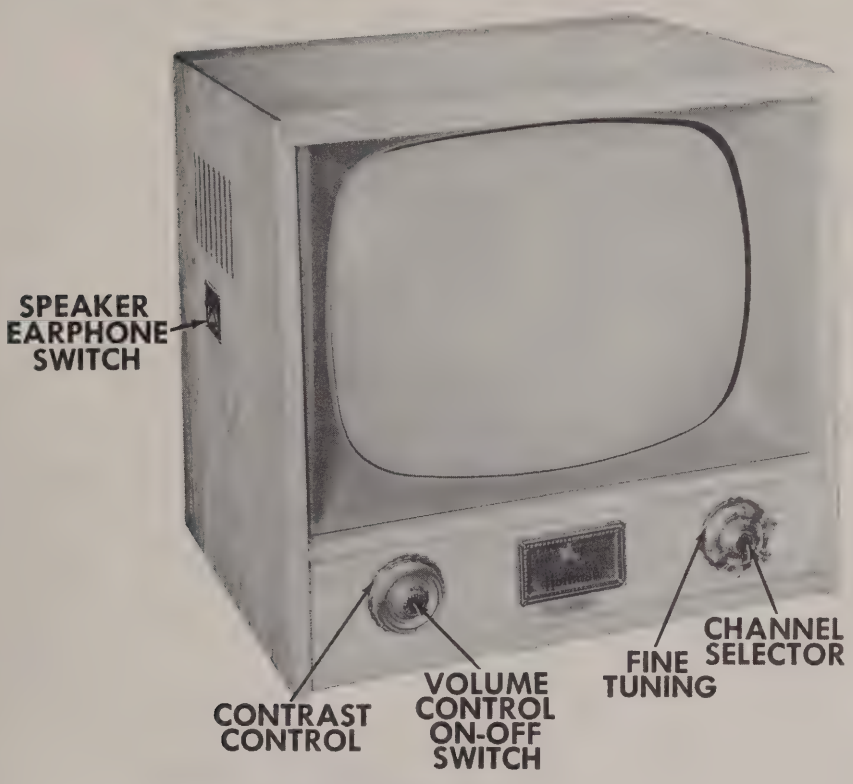

HOFFMAN MODEL 21B179N

TRADE NAME	Hoffman	MODELS	CHASSIS
		21B179, U, 21B346, U, 21M178, U, 21M345, U, 21P180, U	407-21
		21B179L, LU, 21M178L, LU, 21P180L, LU	407-21L
		21B179N, NU, 21M178N, NU, 21P180N, NU	407-21N
MANUFACTURER	Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.		
TYPE SET	Television Receiver		
TUBES	Twenty-one		
POWER SUPPLY	110-120 Volts AC - 60 Cycles		RATING 1.82 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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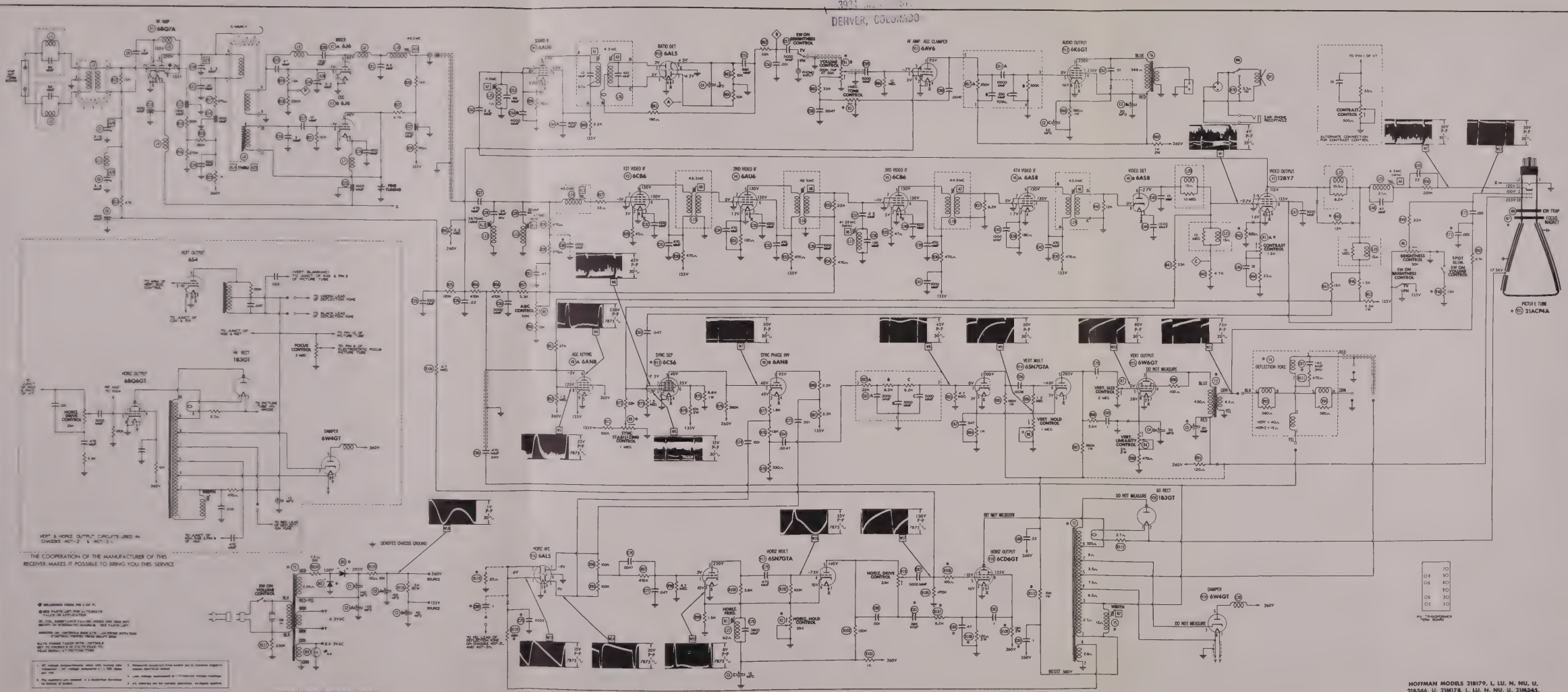

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CHASSIS TOP VIEW

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CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

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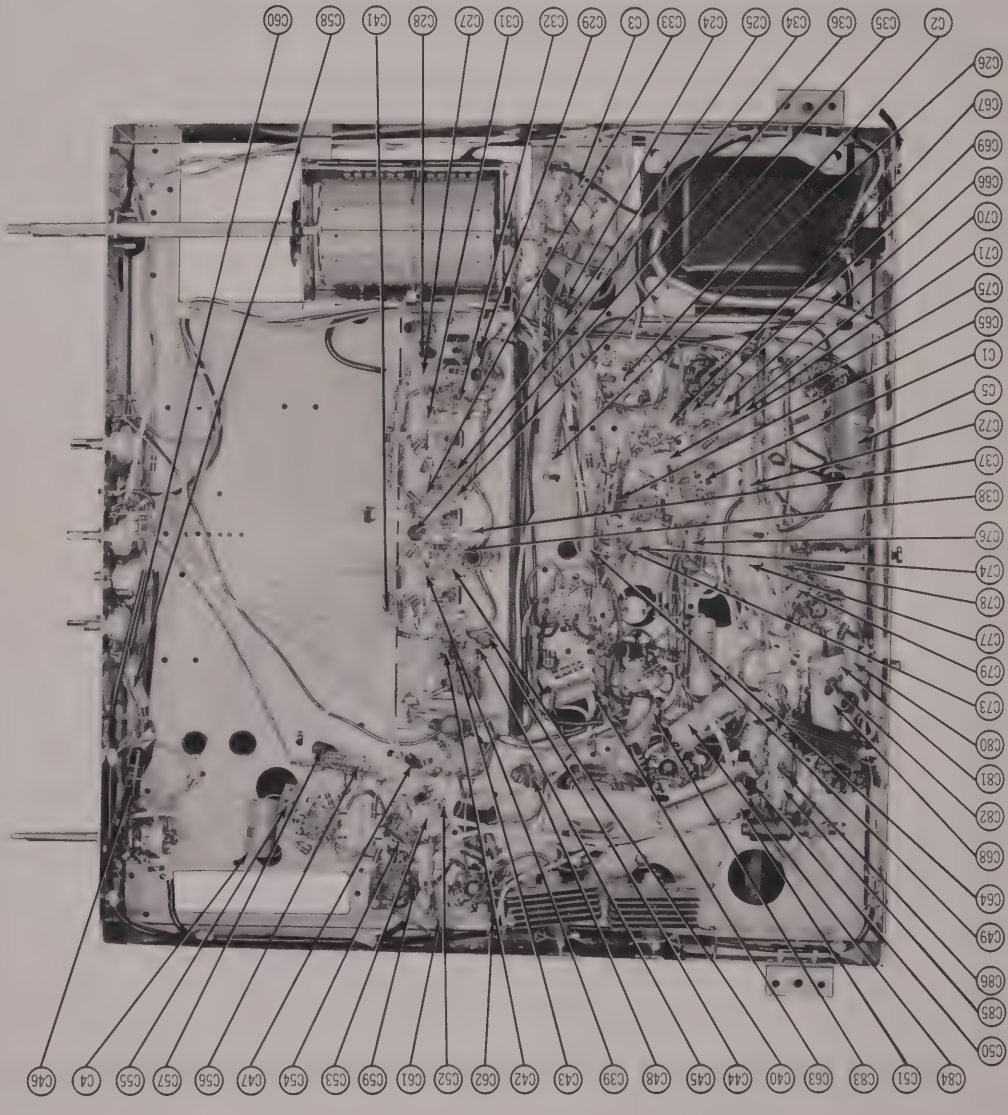

TUBE PLACEMENT CHART

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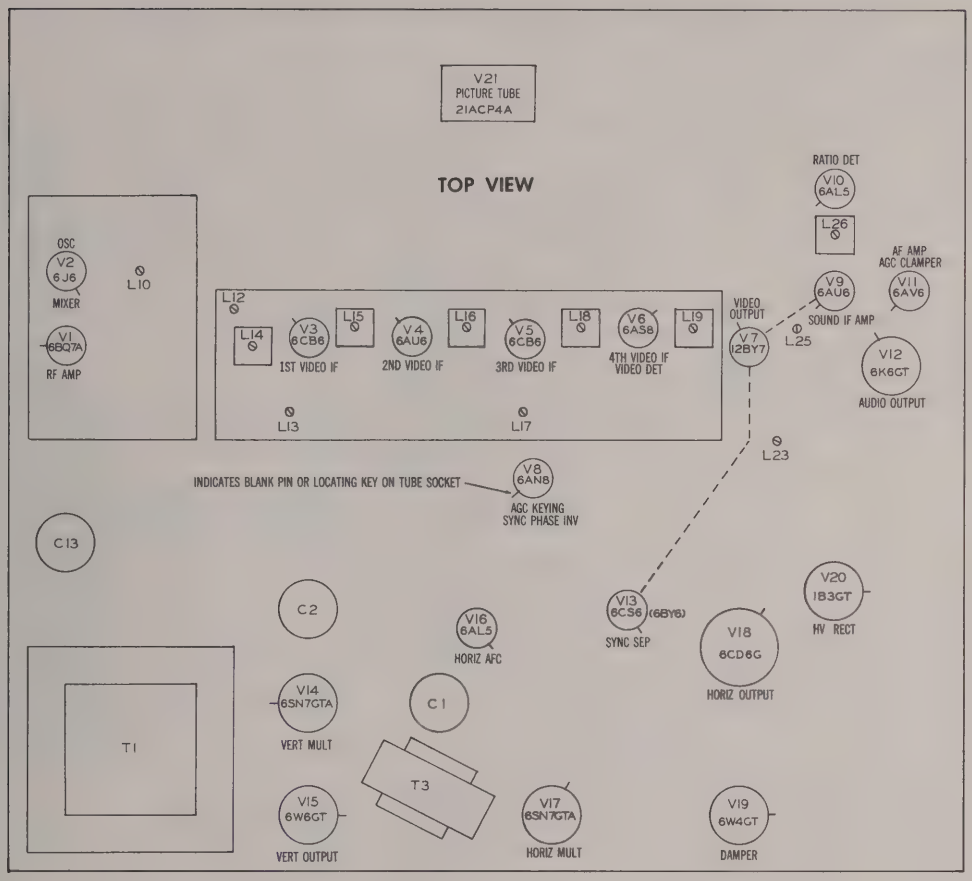

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V7**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V7, V8, V21**
Has pic, no sound - **V9, V10, V11, V12**
Overloaded picture - **V8, V11**

SYNC FAILURE
No vert. sync - **V8, V14**
No horiz. sync - **V8, V16, V17**
No vert. or horiz. sync - **V8, V13**

SWEEP FAILURE
No raster, has sound - **V17, V18, V19, V20, V21**
No vertical deflection - **V14, V15**
Poor vert. linearity or foldover - **V14, V15**
Poor horiz. linearity or foldover - **V17, V18, V19**
Narrow picture - **V17, V18, V19, V20, M1, M2**
Vert. off freq. - **V8, V14**
Horiz. off freq. - **V8, V16, V17**

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Do not remove the horizontal oscillator tube (V17) to eliminate the high voltage shock hazard.
The high voltage lead should be taped securely and kept away from chassis.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set contrast control for maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.005MFD	High side to pin 3 (grid) of 12BY7 (V7). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru 10KΩ to point Ⓐ. Common to chassis.	A1, A2	Attenuate signal level to obtain 5 volts on VTVM. Adjust for maximum deflection.
2.	"	"	"	"	DC probe thru 10KΩ to point Ⓑ. Common to chassis.	A3	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 1 and 2 until readings do not change.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Set contrast control for maximum.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.005MFD	High side to pin 3 (grid) of 12BY7 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A1, A3	Disconnect stabilizing capacitor (C4). Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	"	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.	A3	Reconnect stabilizing capacitor (C4). Adjust so that 4.5MC occurs at crossover lines as in Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Set contrast control for maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.005MFD	High side to pin 3 (grid) of 12BY7 (V7). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector (Fig.9) to pin 11 (cathode) of picture tube. Common to chassis.	A4	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

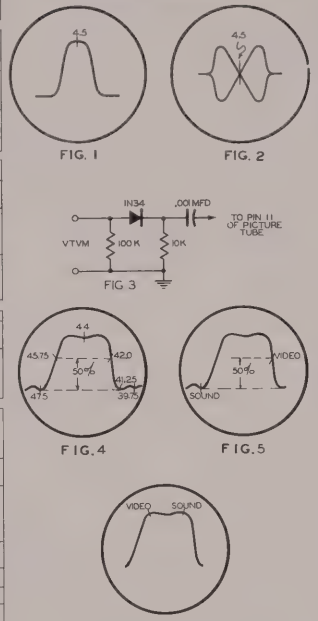
Use only enough signal generator output to provide usable reading on VTVM.
Connect the negative lead of a 4 volt bias supply to the ungrounded side of C51. Connect positive lead to chassis.
Remove the converter tube (V3) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications. An alternate method of disabling the local oscillator is to place a piece of transparent cellulose tape on the first two contacts (from front of drum assembly) of any channel strip and then switch the tuner to the insulated strip.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis, same.	41.25MC (Unmod)	Any	DC probe thru 10KΩ to point Ⓒ. Common to chassis.	A5	Adjust for MINIMUM deflection.
5.	"	"	43.0MC	"	"	A6	Attenuate signal generator output to maintain 1 volt at VTVM. Adjust for maximum deflection.
6.	"	"	44.0MC	"	"	A7	"
7.	"	"	42.5MC	"	"	A8	"
8.	"	"	45.3MC	"	"	A9	"
9.	"	"	45.0MC	"	"	A10	Adjust for MINIMUM deflection.
10.	"	"	45.0MC	"	"	A11	Adjust for maximum deflection.
11.	"	"	39.75MC	"	"	A12	Adjust for MINIMUM deflection.
12.	"	"	47.5MC	"	"	A13	"
13.	"	"	45.0MC	"	"	A10	Attenuate generator output to maintain 1 volt at VTVM. Readjust A10 for MAXIMUM deflection. Repeat steps 4 thru 13 until no further improvement is noted.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected to ungrounded side of C51. Positive lead to chassis ground.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44.0MC (10MC Swp)	39.75MC 41.25MC 43.0MC 44.0MC 45.75MC 47.5MC	Any	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.		Check for response curve similar to Fig. 4. Use high scope gain. If necessary, retouch A5 thru A13 for desired response. Maintain -4 volts bias while checking response curve. If necessary, remove bias to observe trap markers.



OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket or remove cellulose tape from tuner strip.
The channel oscillator adjustments are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Use only enough sweep generator output to provide usable pattern on scope.
Leave bias battery connected as under "Video IF Alignment" and connect a jumper from the ungrounded side of C51 to tuner AGC terminal.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A14	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	13		A15	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A16	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A17	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A18	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A19	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A20	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A21	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A22	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A23	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A24	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A25	

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A26, A27, A28	Adjust for response similar to Fig. 6 with markers above 90%.
17.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel make compromise adjustment of A26, A27 and A28 with channel switch set to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

44MC TRAP ADJUSTMENT

Adjust the 44MC trap trimmer (A29) for MINIMUM interference on Channel 2.

UHF OSCILLATOR ALIGNMENT

Switch tuner to UHF position and remove tuner knobs. The UHF oscillator adjustment screws are reached thru the same hole used for VHF oscillator adjustments. The correct adjustment screws are accessible thru this hole as the channel switch is turned to each channel strip. Leave bias connected as under "VHF Oscillator Alignment".

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	473MC (10MC Swp)	471.25MC 475.75MC	14	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A30	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			515MC (10MC Swp)	513.25MC 517.75MC	21		A31	
			575MC (10MC Swp)	573.25MC 577.75MC	31		A32	
			635MC (10MC Swp)	633.25MC 637.75MC	41		A33	
			695MC (10MC Swp)	693.25MC 697.75MC	51		A34	
			755MC (10MC Swp)	753.25MC 757.75MC	61		A35	
			815MC (10MC Swp)	813.25MC 817.75MC	71		A36	
			875MC (10MC Swp)	873.25MC 877.75MC	81		A37	

UHF RF AND MIXER ALIGNMENT

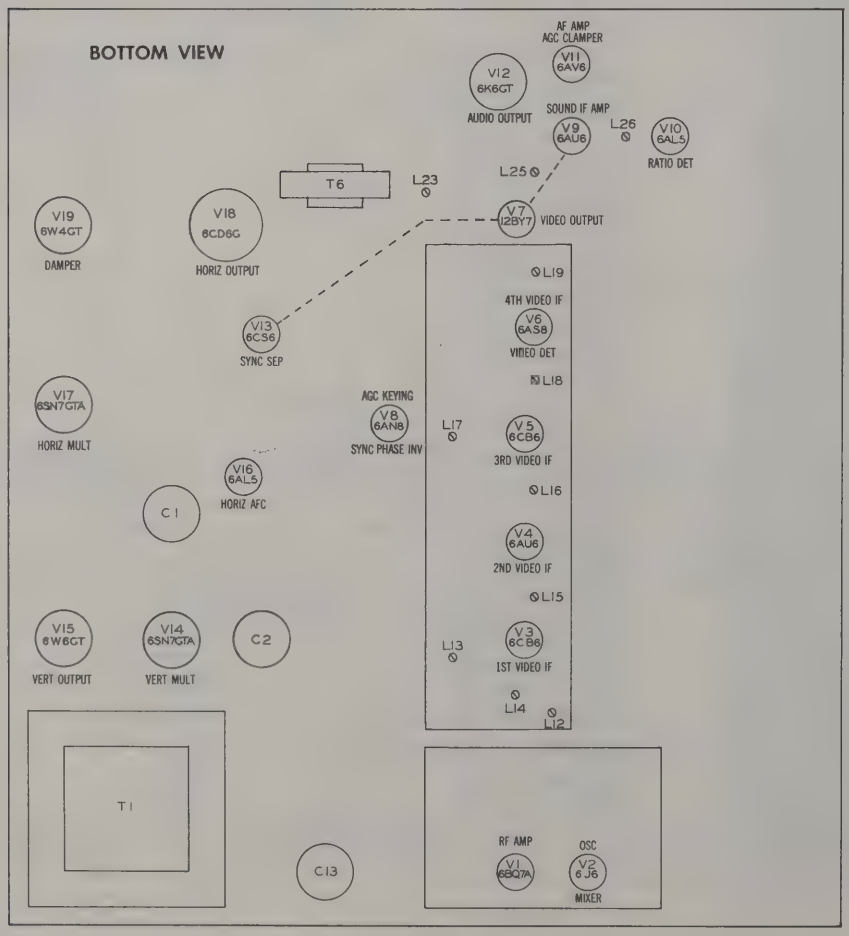
The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

HOFFMAN MODELS 21B179, L, LU, N, NU, U, 21B346, U, 21M178, L, LU, N, NU, U, 21M345, U, 21P180, L, LU, N, NU, U (Ch. 407-21, L, N)

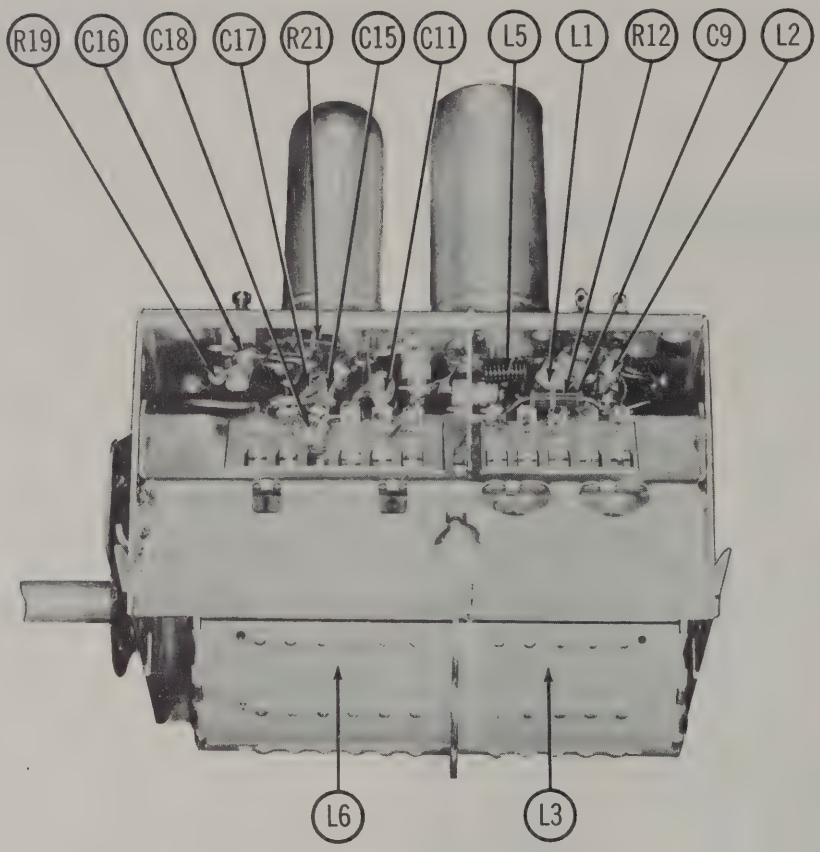
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	700KΩ	0Ω	.1Ω	0Ω	†1.7KΩ	†200KΩ	INF	0Ω
V 2	6J6	†6.4KΩ	†15KΩ	.1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 3	6CB6	50KΩ	47Ω	.1Ω	0Ω	†2KΩ	†2KΩ	0Ω		
V 4	6AU6	.1Ω	0Ω	.1Ω	0Ω	†2KΩ	†2KΩ	120Ω		
V 5	6CB6	50KΩ	47Ω	.1Ω	0Ω	†2KΩ	†2KΩ	0Ω		
V 6	6AS8	†2KΩ	.1Ω	180Ω	0Ω	.1Ω	4.7KΩ	0Ω	.1Ω	†2KΩ
V 7	12BY7	300Ω	4.7KΩ	0Ω	0Ω	0Ω	.1Ω	†6.4KΩ	†1.6KΩ	0Ω
V 8	6AN8	6KΩ	†390KΩ	4KΩ	.1Ω	0Ω	†15KΩ	†120Ω	†50KΩ	†1.6KΩ
V 9	6AU6	1Ω	150Ω	.1Ω	0Ω	†3.8KΩ	†3.8KΩ	150Ω		
V 10	6AL5	INF	INF	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 11	6AV6	10Meg	0Ω	0Ω	.1Ω	600KΩ	600KΩ	†250KΩ		
V 12	6K6GT	TP	0Ω	†1.4KΩ	†1.1KΩ	500KΩ	INF	.1Ω	560Ω	
V 13	6CS6	35KΩ	0Ω	0Ω	.1Ω	†390KΩ	12KΩ	1.5Meg		
V 14	6SN7GTA	4.7Meg	▲190KΩ	1KΩ	1.5Meg	▲680KΩ	1KΩ	.1Ω	0Ω	
V 15	6W6GT	TP	0Ω	†700Ω	†800Ω	1Meg	TP	.1Ω	1.1KΩ	
V 16	6AL5	68KΩ	68KΩ	0Ω	.1Ω	5.2Meg	INF	5.2Meg		
V 17	6SN7GTA	4.7Meg	†6.5KΩ	1.5KΩ	120KΩ	†120KΩ	1.5KΩ	.1Ω	0Ω	
V 18	6CD6GT	TP	0Ω	120Ω	TP	470KΩ	TP	.1Ω	†18KΩ	TOP CAP ▲9Ω
V 19	6W4GT	NC	NC	INF	NC	†120Ω	NC	INF	INF	
V 20	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲335Ω
V 21	21ACP4A	0Ω	†30KΩ	PIN 10 †240Ω	PIN 11 †220KΩ	PIN 12 .1Ω				

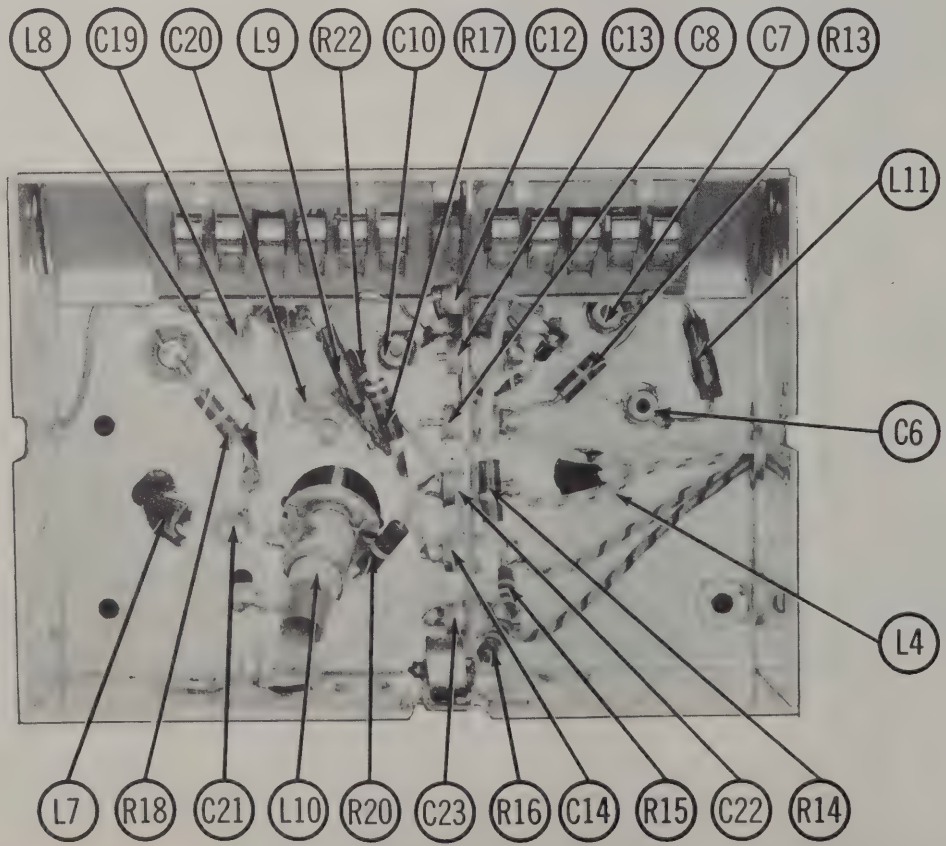
† MEASURED FROM OUTPUT OF M1.
▲ MEASURED FROM PIN 3 OF V19.
TP - TIE POINT
NC - NO CONNECTION



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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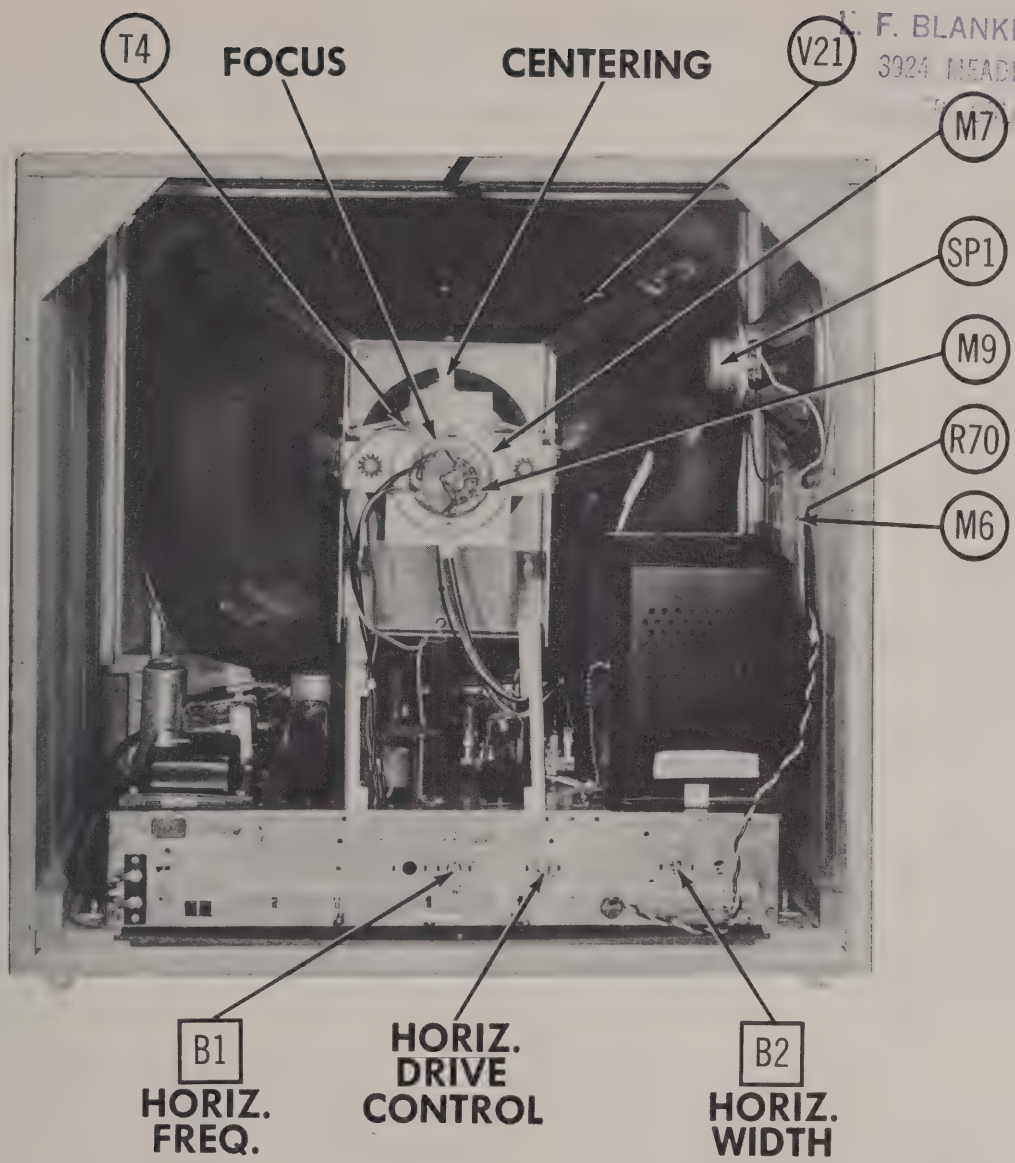

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern.

Turn the horizontal drive control clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Set the horizontal hold control to its mid-range position.

Adjust the horizontal frequency slug (B1) counter clockwise while switching on and off channel until the picture loses sync.

Turn B1 clockwise and note the number of diagonal bars just before the picture pulls into sync. There should be less than two bars if the horizontal section is operating properly. Continue turning B1 clockwise while switching on and off channel, until sync is lost again, then turn B1 counter clockwise and note the point where picture pulls into sync.

Turn B1 an additional half turn counter clockwise.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

HOFFMAN MODELS 21B179, L, LU, N, NU, U, 21B346, U, 21M178, L, LU, N, NU, U, 21M345, U, 21P180, L, LU, N, NU, U (Ch. 407-21, L, N)

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V18 and V19. Check M1 and M2. Check adjustments R10 and B2. Check R114, R109, C82, C80 and other associated components. Check T2 and T4A.

DRIVE LINES

Check by substitution V18 and V19. Check adjustment R10. Check C82, C80, R109, R108 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V18 and V19. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V17, V18 and V19. Check C77 for open. Check C78, C76, R101, L27 and other associated components.

XMAS TREE EFFECT

Check by substitution V17, V18 and V19. Check T2 and T4 for internal arcing. Check L27, C78, C75, C79, R99, R101, R102 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R91, R89, R90, C5 and other associated components.	Check R85, R87, R86, R112, C66, C70 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V14 and V15. Check vertical size and vertical linearity controls for proper operation. Check R87, T3 and other associated components.

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check R7, R112, R87, R85, C66, C70, C67 and other associated components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check R4, R89, C2D, T3 and other associated components.

FOLDS

Check by substitution V14 and V15. Check R88, C69, C70, T3, T4B and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V8 and V13. Check C63, R76, R74, R75, R81 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V14. Check vertical integrator network. Check R8, R86, R85, C66, C64 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V16 and V17. Check C73, C74, C76, C79, L27, R101, R102, R2 and other associated components.

HORIZONTAL BENDING

Check by substitution V8, V13, V16 and V17. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V7. Check C47, C49, R53, R46, R44 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A4. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check L20, L21, L22, C49, R50 and other associated components.

NEGATIVE PICTURE

Substitute V7. Check picture tube. Check R44, R50, R53, C46, C49, L20 and other associated components.

SMEAR

Substitute V7. Check L20, L21, L22, L24, C49, R50 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11 and V12. Check stages V11 and V12 using audio signal generator. Apply audio signal across R1B. Check switch, M6.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C57, C59, C61, C62, C3B, C2C, R69, R67, T6, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A3 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check M1 and M2. Check TV-phono switch for TV position. Check R114. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check M1, M2 and R114. Check B+ filter and decoupling network.

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ALTERNATE TUNER SCHEMATIC

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HOFFMAN MODELS 21B179, L, LU, N, NU, U, 21B346, U, 21M178, L, LU, N, NU, U, 21M345, U, 21P180, L, LU, N, NU, U (Ch. 407-21, L, N)

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	Osc.-Mixer	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp- Video Det.	6AS8	6AS8	9DS	
V7	Video Output	12BY7	12BY7	9BF	
V8	AGC Keying- Sync Phase Inv.	6AN8	6AN8	9DA	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Det.	6AL5	6AL5	6BT	
V11	AGC Clamper- AF Amp.	6AV6	6AV6	7BT	
V12	Audio Output	6K6GT	6K6GT	7S	
V13	Sync Separator	6CS6	6CS6	7CH	6BY6 used as an alternate
V14	Vert. Mult.	6SN7GTA	6SN7GTA	8BD	
V15	Vert. Output	6W6GT	6W6GT	7S	
V16	Horiz.AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. Output	6CD6GT	6CD6GT	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: HOFFMAN PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V21	21ACP4A/ 21AMP4A①	21AMP4A①	21ACP4A/ 21AMP4A ①	21ACP4A/ 21AMP4A ②	21AMP4A ①	12N	① Aluminized ② Silver Screen
	21AUP4A ①					12L	
	21YP4	21YP4A	21YP4	21YP4	21YP4	12L	
	21YP4A ①	21YP4A ①	21YP4A ①	21YP4A②	21YP4A ①	12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HOFFMAN PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C1	140	150	4201A			FP117	TM-140-150	T-055	
C2A	▰140	150	4200A			FP420.26	TM-4113	T-065	
B	■40	150				TC48		FMD-301	
C	▲50	50							
D	30	50							
C3A	▰100	300	4275			FP389.1	TM-12020-300	Q-010	
B	■20	300							
C	▲10	300					TD-12-350		
C4	5	50	4277			TC30	TD-5-50	MMT-0505	
C5	20	450	4233			TC75	TD-20-450	FM-4520	Note 1
C6	3-8			829-10					
C7	3-8			829-10					
C8	1000								
C9	3			TCZ-3	NP0A-030	ZT-5533			
C10	.5-3			829-3	3115-01-0R5	CT565A			
C11	120			DD-121	811-121	UC-5312			
C12	1000								
C13	1000								
C14	1000								
C15	47			DD-470	831-470	UC-5447			
C16	.5-3			829-3	3115-01-0R5	CT565A			
C17	10			TCZ-10	NP0K-100	ZT-541			
C18	5								
C19	1500			DD-152	801-0015	DC-5215			
C20	1500			DD-152	801-0015	DC-5215			
C21	6.8			TCZ-6R8	NP0A-6R8	ZT-5568			
C22	1000								
C23	1000								
C24	5000		4029	DD-502	811-005	DC-525		C-1250	
C25	5000		4029	DD-502	811-005	DC-525		C-1250	
C26	.22	200	4131			PT4022	IMP2-P22	3302022	
C27	470		14050	DD-471	831-471	UC-5347		K-1347	
C28	24	1000		DD-250					
C29	20	1000		DD-200					
C30	1000		14031	DD-102	801-001	DC-521		K-1210	Note 2
C31	470			DD-471	831-471	UC-5347		K-1347	
C32	1000		14031	DD-102	801-001	DC-521		K-1210	
C33	470			DD-471	831-471	UC-5347		K-1347	
C34	470			DD-471	831-471	UC-5347		K-1347	
C35	1000		14031	DD-102	801-001	DC-521		K-1210	
C36	1000		14031	DD-102	801-001	DC-521		K-1210	
C37	2.2			TCZ-2R2	NP0A-2R2				
C38	150	500		TCZ-151	NP0-334-151	MCB236		KR-1315	
C39	470			DD-471	831-471	UC-5347		K-1347	
C40	1000		14031	DD-102	801-001	DC-521		K-1210	
C41	1000		14031	DD-102	801-001	DC-521		K-1210	
C42	470			DD-471	831-471	UC-5347		K-1347	
C43	1000		14031	DD-102	801-001	DC-521		K-1210	
C44	1000		14031	DD-102	801-001	DC-521		K-1210	
C45	10			D6-100	GP1K-100	UC-541		K-1410	
C46	.01	600		D6-103	GP2-333-103	PT611	IMP6-81	330611	
C47	5000		4029	DD-502	811-005	DC-525		C-1250	
C48	47	500		TCZ-47	NP0-338-470	MCB225		KR-1447	
C49	.22	200	4131			PT4022	IMP2-P22	3302022	
C50	5000		4029	DD-502	811-005	DC-525		C-1250	
C51	.47	200	4172			PT4047	IMP2-P47	3302047	
C52	2.2		4069	TCZ-2R2	NP0A-2R2				
C53	68		4046	TCZ-68	NP0-337-680			KR-1468	
C54A	4000		4036	D6-402	822-004	DCD-524		C-1240	
B	4000			D6-402	822-004			C-1240	
C55	680	500		D6-681	GP2K-681	UC-5368		K-1368	

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	HOFFMAN PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
			REPLACEMENT DATA						
C56	.001	400	4174	DS-102	GP2L-103	PT621	IMP6-DI	330631	
C57	5000		4029	DD-502	811-005	DC-525	IMP6-D5	C-1250	
C58	.0047	400	4127	DS-472	GP2-333-472	PT6247	IMP6-D47	3306347	
C59	5000		4029	DD-502	811-[illegible]	DC-525	IMP6-D5	C-1250	
C60	.0047	400	4127	DS-472	GP2-333-472	PT6247	IMP6-D47	3306347	
C61A	20000		†6608	†PC-81	†1403-03				
B	250								
C									
C62	.01	600	4106	DS-103	GP2-333-103	PT611	IMP6-DI	330611	
C63	.047	200	4158	DF-503		PT6147	IMP2-D47	3302147	
C64	.0047	400	4127	DS-472	GP2-333-472	PT6247	IMP6-D47	3306347	
C65A	3000		●8006	●PC-109	●1405-01	PT625	IMP6-D8	330633	
B	5000					PT635	IMP6-D6	330635	
C	8000					PT636	IMP6-D6	330636	
C66	.0039	400	14123			MC3443		CR-1239	
C67	.047	200	4158	DF-503		PT6147	IMP2-D47	3302147	
C68	.22	600	4159			PT6035	IMP6-P35	3306025	
C69	.1	600	4144	DF-104		PT601	IMP6-P1	330601	
C70	.1	600	4144	DF-104		PT601	IMP6-P1	330601	
C71	.022	600	4134	DF-303	811-021	PT6123	IMP6-P23	3306123	Note 3
C72	.033	600	4134	DF-303	811-031	PT6123	IMP6-P23	3306123	
C73	.001	400	4175	DS-102	GP2L-102	PT631	IMP6-DI	330631	
C74	.001	400	4175	DS-102	GP2L-102	PT631	IMP6-DI	330631	
C75	.0033	400		DS-332	GP2-333-332	PT6147	IMP6-D47	3306347	Note 3
C76	.0047	400	4155	DS-472	GP2-333-472	PT6347	IMP6-D47	3306347	
C77	.047	200	4158	DF-503		PT6147	IMP2-D47	3302147	
C78	3000	500	4085			MC3463		CR-1239	
C79	470	500		DS-471	811-471	MC3445		KR-1247	
C80	.001	400	4175	DS-102	GP2L-103	PT631	IMP6-DI	330601	
C81	250	500		DS-251	811-251	MC3543		KR-1239	Note 4
C82	5000		4029	DD-502	811-006	DC-525	IMP6-D6	C-1250	
C83	.1	600	4144	DF-104		PT601	IMP6-P1	330601	
C84	.47	200				PT6047	IMP2-P47	3302047	Note 3
C85	.1	600		DF-104		PT601	IMP6-P1	330601	Note 3
C86	470	3000		DD30-471	3KV-471	DC30347		K-3347	
C87	500	3000							Note 5
C88	.047	600		DF-503		PT6147	IMP6-P47	3306147	Note 6
C89	.1	600	4144	DF-104		PT601	IMP6-P1	330601	Note 6

Note 1: Some versions use 10MFD in this application.
Note 2 Not used in some versions.
Note 3 Not used in Ch. 407-21 and 407-21L.
Note 4. Chassis 407-21 and 407-21L use 470MMF in this application.
Note 5. Chassis 407-21 and 407-21L use 47MMF in this application (part #14048).
Note 6 Not used in Ch. 407-21N.
† Items C61A, C61B, C61C, R67A and R 67B are combined in one unit.
When replacing items separately, C61B and C61C should total 250MMF.
● Items C65A, C65B, C65C, R82A, R82B and R82C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	HOFFMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
			REPLACEMENT DATA					
R1A	1500Ω		H4907	●QJ-536	RTY-514	F1-7	UF152R	Contrast - Panel - Note 1
B	50KΩ					R2-47	UB55-7J4	Volume tapped at 50KΩ - Rear
C	Switch					UB-37		Attach to R1B
R2A	500Ω		H4980	●QJ-527	RTV-463	F1-4	UF52L	Contrast - Panel - Note 3
B	150KΩ					R2-48	UB55-7J34	Volume tapped at 150KΩ - Rear
C	Switch					KB-1	UB-26	Attach to R1B
R3A	1Meg		H4979	QU-130	A47-25K-S	AB-25	U-56	Horiz. Hold - Note 3
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R3A	1Meg		H4980	QU-137	A47-1Meg-S	AB-89	U-54	Tone - Note 4
B	Shaft		Not Req.	Not Req.	KSS-2	AK-4	Not Req.	Attach to R3A
R4A	3000Ω	3	H4984	WR-3000	A43-3000		R3500L	Vert. Linearity (Wire wound)
B	Shaft		Not Req.	Not Req.	FKS-1/4		Not Req.	Attach to R4A - Note 5
R5A	50KΩ		H4994	QU-133	A47-50K-S	BX-31	SU-35	AGC
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6	50KΩ		H4987					Brightness & Phono Switch
R7A	1Meg		H4985	QU-139	A47-1Meg-S	BX-75	SU-56	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R7A
R8A	1Meg		H4980	QU-137	A47-1Meg-S	AB-89	U-54	Vert. Hold - Note 4
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R8A
R9A	1Meg		H4980	QU-137	A47-1Meg-S	AB-89	U-54	Sync Stability - Note 4
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R9A
R10A	25KΩ		H4950	QU-130	A47-25K-S	AB-25	SU-29	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R10A
R11A	1Meg		H4994	QU-139	A47-2Meg-S	AB-75	SU-56	Focus - Note 6
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R11A

Note 1: Some versions use as alternate control part no. H4925.
Note 2: Not used in some versions
Note 3: Some versions use an alternate control part no. H4962.
Note 4: Some versions use an alternate control part no. H4963.
Note 5: Some versions use an alternate control part no. H4925 or H4960.
Note 6: Used in chassis 407-21 and 407-21L only.
† Universal replacement (Mallory exact duplicate part no. UK1823)
†† Universal replacement (Mallory exact duplicate part no. UK-78)
• CONCENTRIKIT EQUIVALENT: KIT K-2, BASE ELEMENTS & SHAFTS: B1T-109 & P1-204 (PANEL)
B13-133X & RL-223 (REAR)
76-2 SWITCH
• CONCENTRIKIT EQUIVALENT: KIT K-3, BASE ELEMENTS & SHAFTS: B1T-103 & P1-204 (PANEL)
B13-132X & RL-223 (REAR)
76-1 SWITCH

RESISTORS

ITEM No	RATING OHMS	RATING WATT	HOFFMAN PART No	IRC PART No.	NOTES
			REPLACEMENT DATA		
R12	15K.	½		BTS-15K	
R13	47KΩ	½		BTS-47K	
R14	100KΩ	½		BTS-100K	
R15	180KΩ	½		BTS-180K	
R16	270KΩ	½		BTS-270K	
R17	470Ω	½		BTS-470	
R18	220KΩ	½		BTS-220K	
R19	15KΩ	½		BTS-15K	
R20	15KΩ	½		BTS-15K	
R21	10KΩ	½		BTS-10K	
R22	470KΩ	½		BTS-470K	
R23	1000Ω	½	4543	BTS-1000	
R24	150Ω	½	4565	BTS-150	
R25	120KΩ	½	4548	BTS-120K	
R26	470Ω	½	4636	BTS-470	
R27	33Ω	½	4688	BTS-33	
R28	470Ω	½	4684	BTS-470	
R29	470Ω	½	4684	BTS-470	
R30	470Ω	½	4684	BTS-470	
R31	120Ω	½	4546	BTS-120	
R32	470Ω	½	4684	BTS-470	
R33	22KΩ	½	4638	BTS-22K	
R34	470Ω	½	4684	BTS-470	
R35	470Ω	½	4684	BTS-470	
R36	33Ω	½	4688	BTS-33	
R37	5300Ω 5%	½	4681	BTS-5300 5%	
R38	180Ω	½	14618	BTS-180	
R39	470Ω	½	4684	BTS-470	
R40	120Ω 5%	½	4640	BTS-120 5%	
R41	33KΩ	½	24527	BTS-33K	
R42	4700Ω	½	4578	BTS-4700	
R43	820Ω	½		BTS-820	Note 1
R44	33Ω	½	4688	BTS-33	
R45	12KΩ	½		BTS-12K	Note 1
R46	1500Ω	½		BTS-1500	
R47	15KΩ	½	4531	BTS-15K	
R48	15KΩ	½		BTS-15K	Note 2
R49	22KΩ	½	4501	BTS-22K	
R50	330KΩ	½		BTS-330K	
R51	47KΩ	½	4504	BTS-47K	
R52	1.5Meg 5%	½	14603	BTS-1.5Meg 5%	
R53	3300Ω	½	4612	BTA-3300	
R54	470KΩ	½	4622	BTS-470K	
R55	2.2Meg 5%	½	34820	BTS-2.2Meg 5%	
R56	470Ω	½	4506	BTS-470	
R57	3300Ω 5%	½	34541	BTS-3300 5%	
R58	15KΩ	½	4531	BTS-15K	
R59	150Ω	½	4565	BTS-150	
R60	2300Ω	½	4650	BTS-2300	
R61	180Ω	½	14618	BTS-180	
R62	33KΩ	½	4588	BTS-33K	
R63	10KΩ	½	4597	BTS-10K	
R64	10KΩ	½	4597	BTS-10K	
R65	33KΩ	½	4588	BTS-33K	
R66	10Meg	½	4505	BTS-10Meg	
R67A	250KΩ				
B	500KΩ		†5800	BTS-220K	
C	500KΩ			BTS-470K	
R68	560Ω	1	4631	BTA-560	
R69	1000Ω	3	14697	BTB-1000	
R70	3.3Ω	1	4743		
R71	100KΩ	½	4511	BTS-100K	
R72	22KΩ	½	4501	BTS-22K	
R73	1.5Meg	½	4605	BTS-1.5Meg	
R74	15KΩ	3		BTB-15K	
R75	560Ω	1	4557	BTA-560	
R76	390KΩ	½	4633	BTS-390K	
R77	1800Ω	1	4560	BTS-1800	
R78	1800Ω 5%	½	24517	BTS-1800 5%	
R79	330Ω	1	14644	BTS-330	
R80	2200Ω	½	4650	BTS-2200	
R81	2300Ω 5%	½	24525	BTS-2300 5%	
R82A	22KΩ			BTS-22K	
B	330Ω	½	●8005	BTS-8200	
C	2200Ω			BTS-8300	
R83	4.7Meg	½	4544	BTS-4.7Meg	
R84	1000Ω	½	4559	BTS-1000	
R85	180KΩ	1		BTA-180K	
R86	1.2Meg	½	34593	BTS-1.2Meg	
R87	680KΩ	1		BTA-680K	
R88	5600Ω	½	4639	BTS-5600	
R89	4700Ω	½	4684	BTS-470	
R90	100Ω	½	4547	BTS-100	
R91	120Ω	½	4546	BTS-120	
R92	4700Ω 5%	½		BTS-4700 5%	
R93	560Ω	½	4507	BTS-560	
R94	560Ω	½	4507	BTS-560	
R95	100KΩ	½	4571	BTS-100K	
R96	100KΩ	½	4571	BTS-100K	
R97	470KΩ	½	4622	BTS-470K	
R98	4.7Meg	½	4544	BTS-4.7Meg	
R99	1500Ω	½	4630	BTS-1500	
R100	5600Ω	½	4639	BTS-5600	
R101	1000Ω	½		BTS-1000	
R102	100KΩ	½	4571	BTS-100K	
R103	120KΩ	½	4548	BTS-120K	
R104	4.7Meg	½	3485	BTS-4.7Meg	
R105	470KΩ	½		BTS-470K	
R106	100Ω	½	4547	BTS-100	Note 2
R107	470KΩ	½	4622	BTS-470K	Note 2
R108	120Ω	2			Note 2
R109	18KΩ	2	4631	BTB-18K	Note 4
R110	68KΩ	½		BTS-68K	Note 2
R111	470Ω	½	4636	BTS-470	
R112	10KΩ	1		BTA-10K	Note 5
R113	2.7Ω	½	4763		
R114	7.5Ω	5	4798		
R115	12Ω	10	4784		
R116	1500Ω	20	4772		
R117	330Ω	½	4677	BTS-330K	
R118	150KΩ	½		BTS-150K	Note 2
R119	22Ω	1		BTS-22	Note 2

Note 1: Not used in some versions.
Note 2: Not used in chassis 407-21 and 407-21L.
Note 3: Chassis 407-21, L use a 5800Ω resistor in this application.
Note 4: Chassis 407-21, L use a 10KΩ resistor in this application.
Note 5: Chassis 407-21, L use a 470Ω resistor in this application.
† Items R67A, R67B, C61A, C61B and C61C are combined in one unit.
• Items R82A, R82B, R82C, C65A, C65B and C65C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No
				REPLACEMENT DATA						
T1	117VAC	124VAC	6.3VAC	5055-1					26R13 ③	P-52BC②
	②1. 82A	. 392ADC	②1. 2A	5053 ①						
	SEC. 3	SEC. 4	SEC. 5							
	5. 3VAC, ③10 AA									

① Used in chassis 407-21 and 407-21L.
② Parallel and phase 5.3V② 7A and 8A windings for Sec. #3.
③ Parallel and phase high current 6.3V windings for Sec. #3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	HOFFMAN PART No	Halldorson PART No.	Merit PART No	RCA PART No	Ram PART No	Stancor TYPE No	Thordarson PART No	Triad PART No
		REPLACEMENT DATA							
T2	Horiz. Output Trans.	5158A ①	FB419 & RF800●		2357I & 2148I●	X094 & 202R14●		F1Y-16 & WC-20●	D50 & WC-19●
T2	Horiz. Output Trans.	5184 ②	FB41I●	HVO-9●	2307I●	X080●	A-8157 & WC-3	F1Y-18●	D-19●
T3	Vert. Output Trans.	5188-6 ① 5188 ③				V302 & V302 &	A-8142 & A-8142 &	26S72 & 26S73	A-108X & A-108X
T4A	Yoke(90°) Horiz(12M10 Vert(40MH)	5209A ② 5121A ④	Z1806 & MDF-01 ⑤	A-3039 & 218DI ⑤	228TI & 450I	X312 &	A-8161 & DY-13A ⑤	26S34 & Y-14 ⑤	A-104X & Y-40-I ⑤
B									
T4A	Yoke(70°) Horiz(63MH) Vert(37MH)	9729 ②	DF605 ⑤	MDF-73 ⑤	222DI ⑦	Y70F30/43	DY-11A ⑤	Y-9 ⑤	Y-22-I ⑤
B									
T5	Width Coil (L2-16MH)	5464 ①③	RF800 ⑩ ⑫	MWC-1 ⑩ ⑫	212RI	20IRI6	WC-5 ⑩ ⑫	WC-18 ⑩	WC-13 ⑩

① Used in 90° chassis; 407-21N.
② Used in 70° chassis; 407-21 and 407-21L.
③ Alternate vert. output trans. for 90° chassis only.
④ Drill new mounting hole(s).
⑤ Use original horiz. yoke damping network if necessary.
⑥ Use original yoke damping network.
⑦ See instructions packed with unit pertaining to yoke damping network.
⑧ Connect horiz. damping network across terminals #3 and #7. Use original network, if necessary.
⑨ Remove damping capacitor from terminals #1 and #2. Use original horiz. damping network, if necessary.
⑩ Enlarge mounting hole.
⑪ Connect to terminals #1 and #2.
⑫ Connect to coded red and blue terminals.

(FOR PART NO. 5184) 70°

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
9	9	9	9	9	7	9	9
				Jumper			Jumper
8	8	8	8	7 & 8	4	8	7 & 8
7	7	7	5 or 4	T	7	7	7 & 8
				Note ⑭			
5	5	5	5	T	Note ⑭	5	4
4	4	4	3	3	4	T	T
3	3	3	1	1	3	3	3
1	1	1	1	3	1	1	1
Connect Width Coil Here	3 & 1	3 & 1	3 & 1	1 & 3	WC-5 Terms Orange & Black across 1 & 3	3 & 1	3 & 1
Special Note:				⑭			

⑭ Connect red and blue terminals of WC-5 between C8S (original terminal #6 connection) and chassis ground. If AGC does not function properly, reverse these connections.

(FOR PART NO. 5184A) 90°

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
9	9		9	9		9	9
7	7		7	7		7	7
5	5		5	5		5	5
T	4		4	T		T	4
3	3		3	3		3	3
1	1		1	1		1	1
B	RF800 Term #3		214RI Term "C"	20IRI4 Outer winding		WC-20 Term #1	WC-11 Orange term
2	RF800 Term #4		214RI Term "D"	20IRI4 Outer winding		WC-20 Term #2	WC-11 Black term
Connect Width Coil Here: 3 & 1	RF800 Terms #1 & #2 across 3 & 1		214RI Terms A' & 'B' Winding across 3 & 1	20IRI4 Inner Winding across 3 & 1		#3 & #4 across 3 & 1	Red & Blue across #3 & 1
Special Note:	⑬		⑫	⑬		⑬	⑬

⑬ If the picture is out of phase, reverse width coil primary or secondary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	HOFFMAN PART No.	Halldorson PART No.	Merit PART No	Stancor PART No	Thordarson PART No.	Triad PART No.	NOTES
			REPLACEMENT DATA						
T6	6.2KΩ	3.4Ω	5168	Z1003	A-3020	A-3823	26S40	S-53X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	HOFFMAN PART No.	CQAM PART No	NOTES
				REPLACEMENT DATA		
SP1	8½" X 10 5/8"	PM	3.4Ω	9079		

HOFFMAN MODELS 21B179, L, LU, N, NU, U, 21B346, U, 21M178, L, LU, N, NU, U, 21M345, U, 21P180, L, LU, N, NU, U (Ch. 407-21, L, N)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap	0Ω						Wound on 68MMF Cap.
L2	IF Trap	0Ω						Wound on 68MMF Cap.
L3	Ant. Coils	0ΩCT	0Ω					
L4	Fil. Choke	0Ω						
L5	Neut. Coil	0Ω						
L6	RF, Mixer Grid & Osc. Coils	0Ω						
L7	Fil. Choke	0Ω						
L8	RF Coil	0Ω						
L9	Feedback Coil	1.4Ω						
L10	Conv. Plate	0Ω						
L11	Trap Coil	.8Ω						
L12	39.75MC Trap	0Ω		5240A	20-1045 †			
L13	47.25MC Trap	0Ω		5241A	20-1049	TV-153	6226	
L14	1st. Video IF	.1Ω		5243A		TV-130	6231▲	
L15	2nd. Video IF	.1Ω	.1Ω	5538-6	17-4521 *	TV-128 ■	6233 ■	
L16	3rd. Video IF	.1Ω	.1Ω	5538-6	17-5002 ■	TV-127 ■	6232 ■	
L17	41.25MC Trap	0Ω		5438				
L18	4th. Video IF	.1Ω	.1Ω	5538-6	17-5004	TV-125	6234	
L19	5th. Video IF	.1Ω	.1Ω	5242A3	17-5004	TV-125	6234	
L20	Series Peaking Coil	15Ω		5545	19-3100 ▲	TV-181 ▲	6153 ▲	108 Microhenries, wound on 10Meg resistor
L21	Shunt Peaking Coil	15Ω		5340	19-3300 ▲		4648 ▲	350 Microhenries, wound on 10Meg resistor
L22	Series Peaking Coil	10.5Ω		5433	19-3100 ♦	TV-181 ♦	6153 ♦	105 Microhenries, wound on 8.2KΩ resistor
L23	4.5MC trap	3.1Ω		5211A	20-1004	TV-151	1469	
L24	Shunt Peaking Coil	12Ω		5548	19-4201 ▲		6154 ▲	210 Microhenries, wound on 10Meg resistor
L25	Sound IF	1Ω		5454	17-3400	TV-151	1469	
L26	Ratio Det.	3.7Ω	.6ΩCT	5235A	17-3493	TV-110	1468	Tertiary winding -.3Ω
L27	Horiz. Osc.	62Ω		5447	19-1576	TV-163	6210	
L28	RF Choke	0Ω		5266	19-1003		4608	4 Microhenries

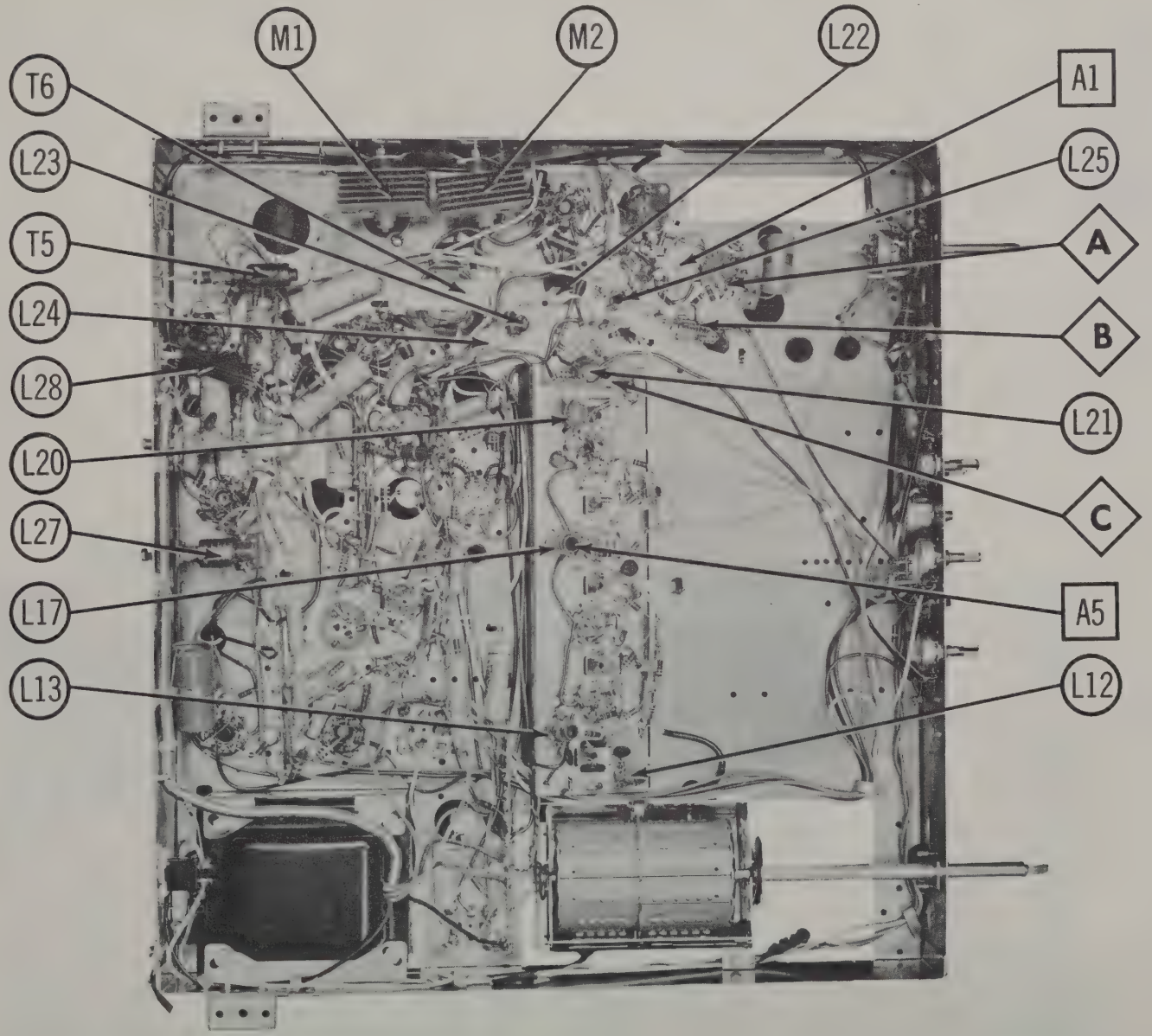
* Drill mounting holes.
■ Detune trap.
▲ Parallel with 10Meg resistor.
♦ Parallel with 8.2KΩ resistor.
▲ Use one winding only.
† Remove resistor and cap. and retune.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA HOFFMAN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.292A	10010	1241A	RS400	6S450	5S2	400	① Used in Ch. 407-21 and 407-21L
M2	.292A	10010	1241A	RS400	6S450	5S2	400	
	.220A	9735 ①	1023A	RS350	6S350	5QS1	350	
	.220A	9735 ①	1023A	RS350	6S350	5QS1	350	

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M3	Dial Light	9505	#44
M4	Tuner	9839	VHF - Ch. 407-21L, 407-21N
	Tuner	9786	VHF - Ch. 407-21
M5	Tuner	9838	VHF-UHF - Ch. 407-21L, 407-21N
	Tuner	9814	VHF-UHF - Ch. 407-21
M6	Switch	6043	Speaker - Earphone (SPDT-Slide Type)
M7	Focus Magnet	9789	Includes centering device - Ch. 407-21L, 407-21N
M8	Centering Magnet	9722	Ch. 407-21
M9	Ion Trap	9702	



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V17, V18, V19 and V20. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T2, T4A, T5, C85, C83, C84, R109 and other associated components.	Check L27, C79, C78, C82, R101, R99, R103, R100 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V18 and V19. Check M1 and M2. Check R114, R109, C82 and other associated components. Check adjustments R10 and B2.

BLOOMING

Check by substitution V18, V19 and V20. Check M1 and M2. Check C82, C81, C79, R114, R109 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V7. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

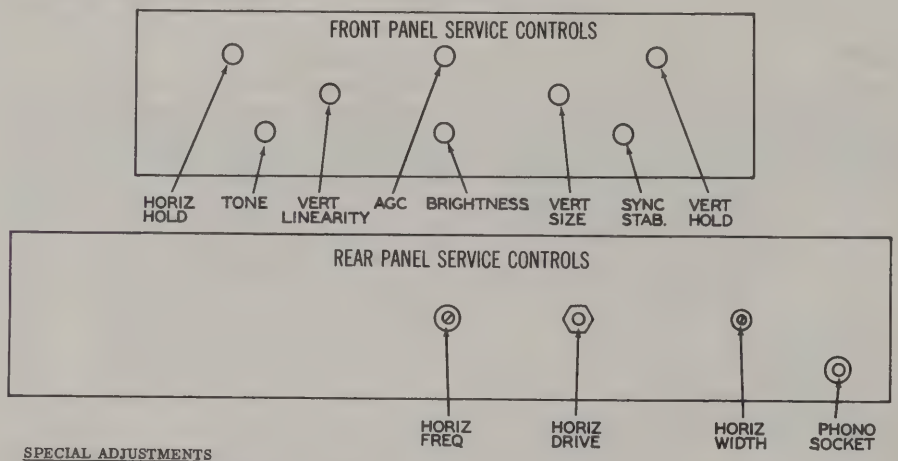
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 5 wood screws holding wood strip at the top of the safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS

SYNC STABILIZER CONTROL ADJUSTMENT

The sync stabilizer control (R9) is located on front panel of the chassis. Adjust R9 control at the point where horizontal and vertical sync is stable.

AGC CONTROL ADJUSTMENT

The AGC control (R5) is located on front panel of the chassis. Adjust R5 control at the point for minimum snow in the picture.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator can be made from the rear panel of chassis. Set horizontal hold control at its mid-range position and adjust the horizontal frequency slug (L27) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L26) located on top of chassis. (See tube placement chart.)

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. focusing assembly. Adjust the centering lever from side to side and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.
2. Loosen 5 wood screws. Remove 1 metal screw. Remove rear cover.
3. Disconnect speaker plug.
4. Remove 2 speaker nuts. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.

PICTURE TUBE REMOVAL

1. Remove chassis.
2. Remove picture tube socket, HV lead and ion trap.
3. Loosen 2 metal screws on front tube mounting band.
4. Remove picture tube.

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DENVER, COLORADO

PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

MASCO
MODEL CS-6P-3

MASCO
MODEL CS-6P-3

TRADE NAME	Masco Model CS-6P-3
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N. Y.
TYPE SET	AC Operated 2 Channel 6 Watt Audio Amplifier With 3 Speed Manual Record Player
TUBES (Three)	Types 12AX7 AF Amp., 6V6GT Output, 6X5GT Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .27 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

MASCO MODEL CS-6P-3

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MASCO PART No.	STANDARD REPLACEMENT		
V1	AF Amp.	12AX7	12AX7	9A	
V2	Audio Output	6V6GT	6V6GT	7S	
V3	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	MASCO PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▬20	450				FP474.5	TM-4053	Q-060	
B	■20	450							
C	10	450							
D	▲10	450							
C2	10	50				TC-32	TD-10-50	MMT-0510	
C3	10	50				TC-32	TD-10-50	MMT-0510	
C4	.005	600		D6-502	811-005	PT625	IMP6-D5	330625	
C5	.01	600		D6-103	811-01	PT611	IMP6-S1	330611	
C6	.01	600		D6-103	811-01	PT611	IMP6-S1	330611	
C7	.005	600		D6-502	811-005	PT625	IMP6-D5	330625	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½		Q13-133	A47-500K-Z	B-60	U-48	Volume
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	6163925	Q13-133	A47-500K-Z	B-60-S	U-48	Tone
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MASCO PART No.	IRC PART No.	
R3	1Meg	½		BTS-1Meg	
R4	5.6Meg	½		BTS-5.6Meg	
R5	270KΩ	½		BTS-270K	
R6	3300Ω	½		BTS-3300	
R7	270KΩ	½		BTS-270K	

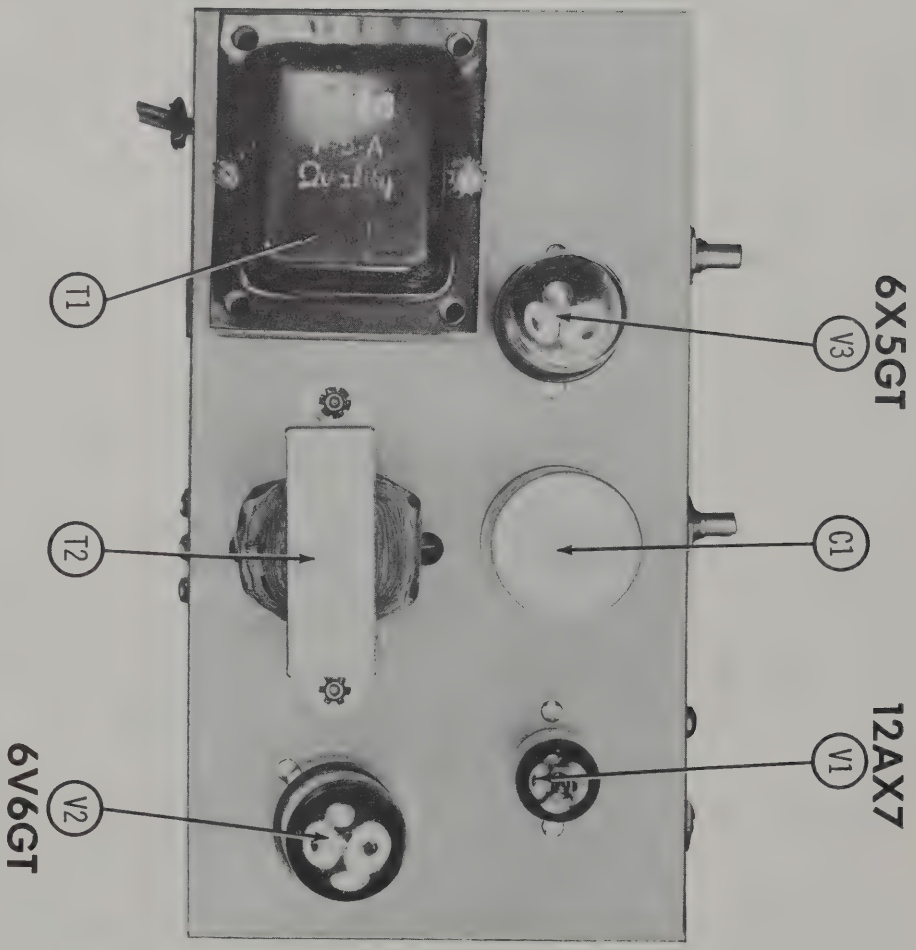
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MASCO PART No.	IRC PART No.	
R8	47KΩ	½		BTS-47K	
R9	4700Ω	½		BTS-4700	
R10	470KΩ	½		BTS-470K	
R11	270Ω	1		BTA-270	
R12	270Ω	2			

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MASCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .27A	485VCT .041ADC	6.3VAC ②1.5A		P-5A	P9213	P-3047	PM-8419	24R00①	R-8B①

① Tape 5V winding and the 6.3V winding center tap.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MASCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6KΩ	8Ω Tap @ 4Ω	T-6	Z1109		A-3870	22S58		

PHONO CARTRIDGE

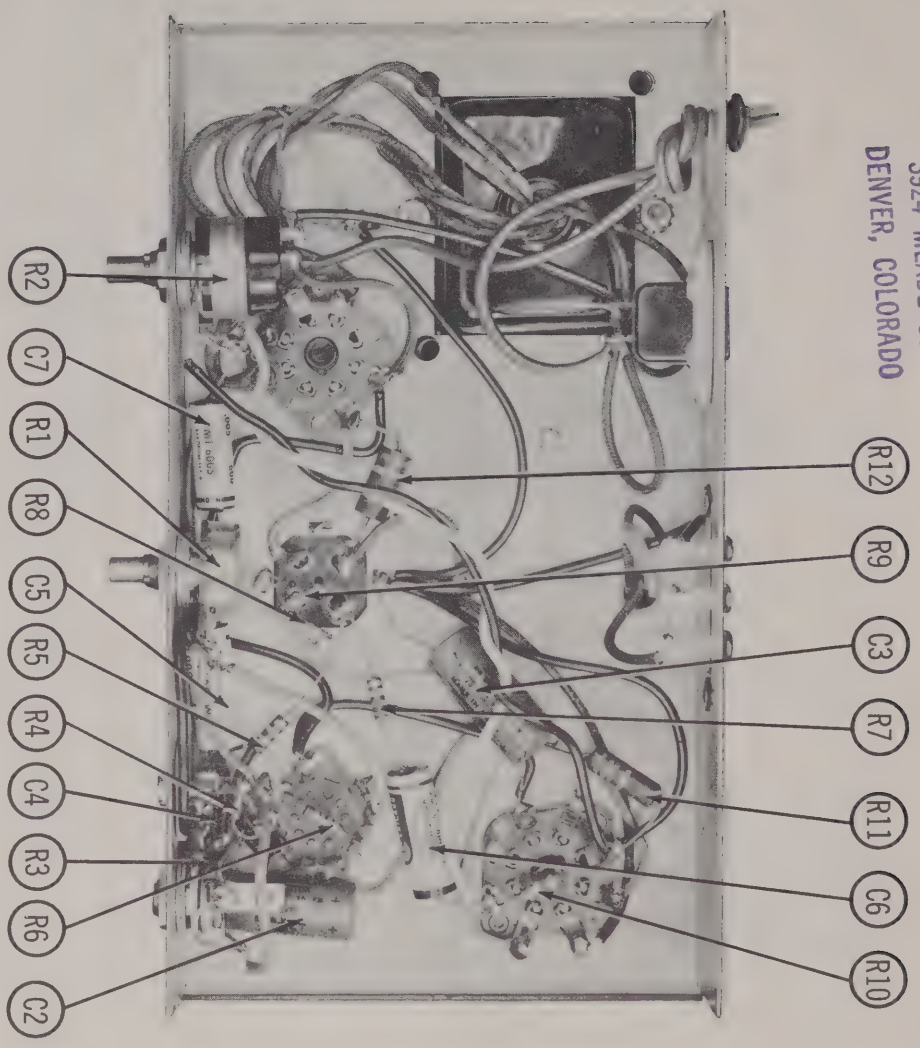
ITEM No.	REPLACEMENT DATA					REMARKS
	MASCO PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		66-TMY *W-66-T		*2600		*Complete tone arm and cartridge ass'y.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	MASCO PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		*A-70LP and *A-70	*A-428 and *C-430	*W-25MGA and *W-25A	* Metal

CHASSIS—BOTTOM VIEW



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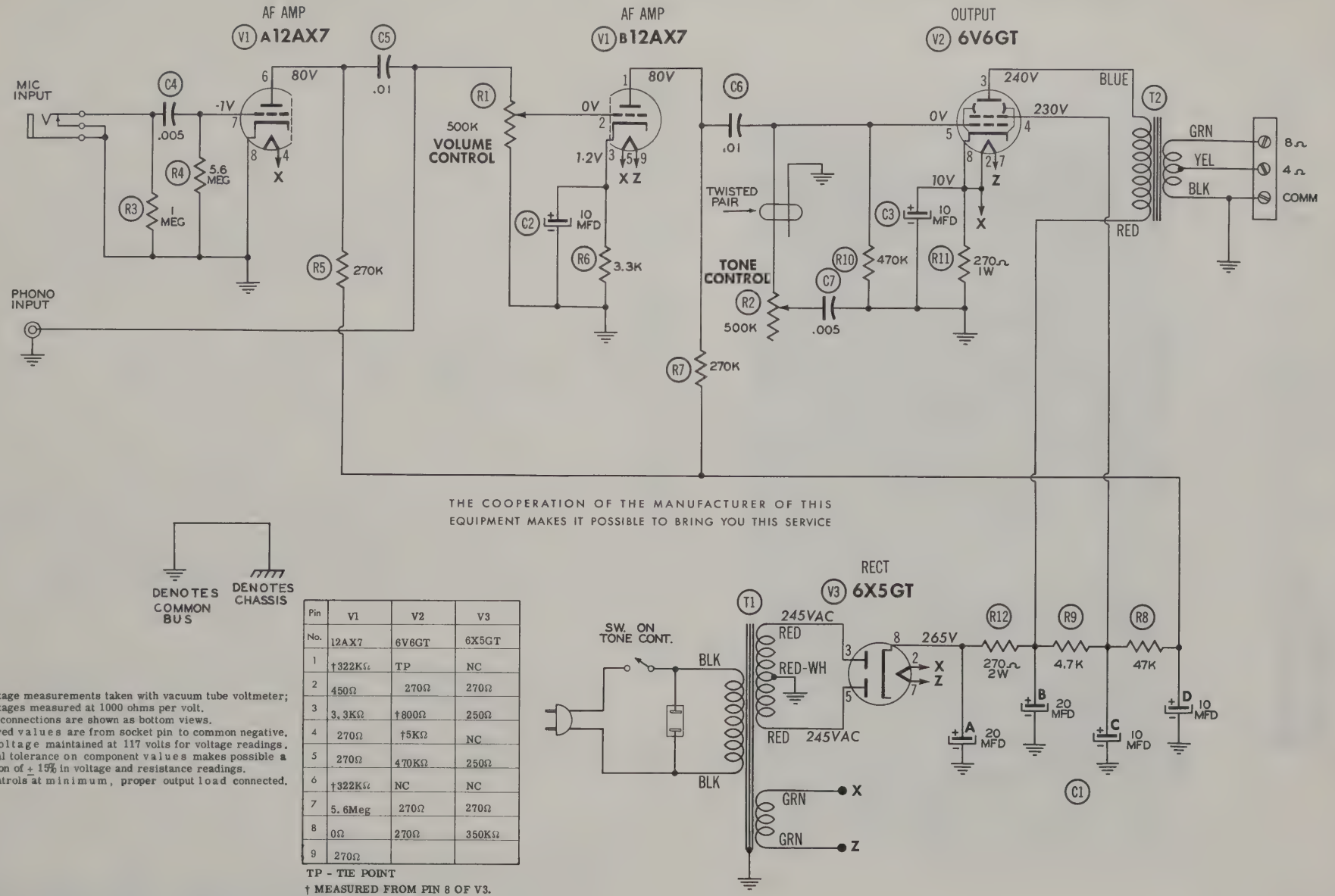
MASCO
MODEL CS-6P-3



Pin No.	V1 12AX7	V2 6V6GT	V3 6X5GT
1	†322KΩ	TP	NC
2	450Ω	270Ω	270Ω
3	3.3KΩ	†800Ω	250Ω
4	270Ω	†5KΩ	NC
5	270Ω	470KΩ	250Ω
6	†322KΩ	NC	NC
7	5.6Meg	270Ω	270Ω
8	0Ω	270Ω	350KΩ
9	270Ω		

TP - TIE POINT
† MEASURED FROM PIN 8 OF V3.
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MOPAR MODELS
832 (P-5506), 835 (C-5509)

MOPAR MODELS
832 (P-5506), 835 (C-5509)

TRADE NAME	Mopar Models 832 (Philco Model P5506-1955 Plymouth Cars), 835 (Philco Model C-5509-1955 Chrysler cars)
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Eight)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC AF Amp., 6C4 Phase Inv., (2) 6AQ5 Output, 6X4 Rectifier
POWER SUPPLY	6 Volts Storage Battery — RATING 7.8 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540KC-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	265KC (400∿Mod)	Extreme high freq. end of dial	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to auto receptacle.	1605KC	1605KC	"	A5	"
3.	"	"	1400KC	1400KC	"	A6, A7	Adjust for maximum output. With receiver installed in car and antenna plugged in, tune to weak signal near 1400KC. Adjust A6 for maximum volume.

PUSH BUTTON ADJUSTMENT

1. Turn radio on and allow to operate for fifteen minutes. Antenna should be fully extended.
2. Unlock push buttons by pulling them out.
3. Accurately tune in a station with the manual tuning knob.
4. Lock one push button to that station by pushing firmly in.
5. Repeat above procedure for remaining push buttons.

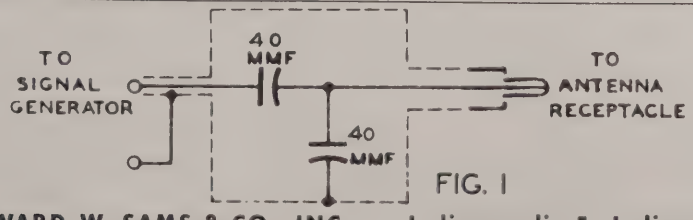

FIG. 1

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PARTS LIST AND DESCRIPTIONS

MOPAR MODEL 832

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp	6AV6	6AV6	7BT	
V5	Phase Inv.	6C4	6C4	6BG	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■20	350	61-0086A			FP333.6	TM-3028	T-465	
B	▲10	350							
C	20	25							
C2	.047	200	30-4650-45	DF-503		PT4147	IMP2-S47	3302147	
C3	22		62-022409001	D6-220	GP1K-220	UC-5422		K-1422	
C4	15		62-015409011	D6-150	GP1K-150	UC-5115		K-1415	
C5	250		30-1224-129						
C6	.047	200	30-4650-45	DF-503		PT4147	IMP2-S47	3302147	
C7	.047	400	30-4650-45	DF-503		PT4147	IMP2-S47	3302147	
C8	5000		30-1238-1	DD-502	811-005	DC-525		C-1250	
C9	220		62-122001001	D6-221	GP2K-221	UC-5322		K-1322	
C10	10000		30-1238-2	DD-103	811-01	DC-511			
C11	.1	100	30-4650-47	DF-104		PT401	IMP2-P1	330201	
C12	.25	100	30-4650-49			PT4025	85LPT2-P25	3302025	
C13	5000		30-1238-1	DD-502	811-005	DC-525	IMP6-D5	C-1250	
C14	.01	600	30-4650-58	D6-103	811-01	PT611	IMP6-S1	330611	
C15	.01	600	30-4650-58	D6-103	811-01	PT611	IMP6-S1	330611	
C16	.0068	1000	30-4650-91				CT10-D68		
C17	.022	1000	30-4650-128			PT16122			
C18	.5	100	61-0183			RF480	85LPT2-P5	330205	
C19	.5	100	61-0183			RF480	85LPT2-P5	330205	
C20	330		62-133001001	D6-331	GP2K-331	UC-5333		K-1333	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	*	½	33-5557-15			F1-83	UF106L	Tone - Panel
B	350KΩ	½				R2-35	UR354A	Volume - Rear
C	Bushing					AK-27	EB-214	Attach to R1A
R2	25Ω	2	33-5576-1					Fader - wire-wound

* This control section open in center (2Meg each side of center).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	NOTES
R3	68KΩ	½	66-3688340	BTS-68K	
R4	330Ω	½	66-1338340	BTS-330	
R5	10KΩ	½	66-3108340	BTS-10K	
R6	22KΩ	½	66-3228340	BTS-22K	
R7	330Ω	½	66-1338340	BTS-330	
R8	27KΩ	1	66-3274340	BTA-27K	
R9	22KΩ	½	66-3228340	BTS-22K	
R10	1Meg	½	66-5108340	BTS-1Meg	
R11	10Meg	½	66-6108340	BTS-10Meg	
R12	220KΩ	½	66-4228340	BTS-220K	
R13	10Meg	½	66-6108340	BTS-10Meg	

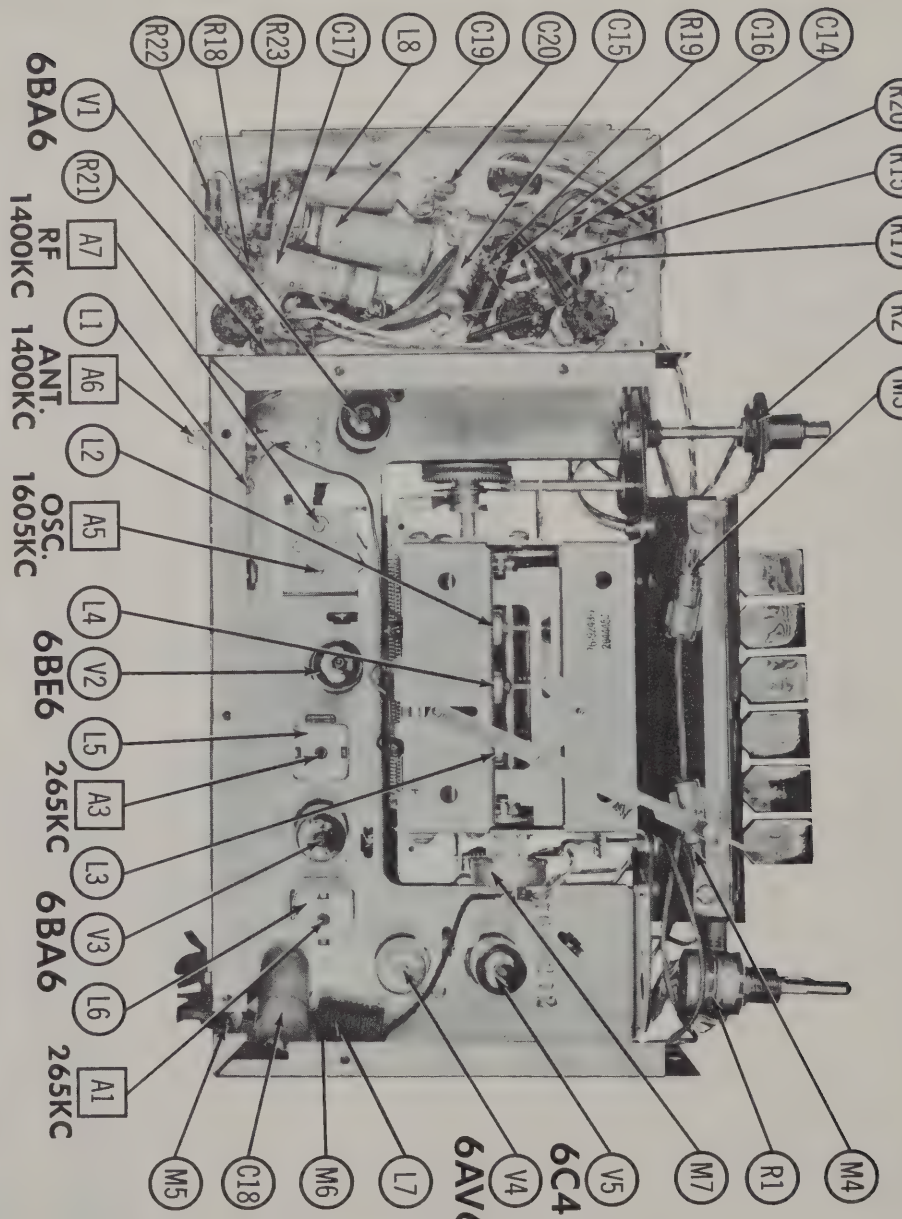
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	NOTES
R14	220KΩ	½	66-4228340	BTS-220K	
R15	220KΩ	½	66-4228340	BTS-220K	
R16	180Ω	½	66-1188340	BTS-180	
R17	470KΩ	½	66-4478340	BTS-470K	
R18	330Ω	1	66-133430	BTA-330	
R19	470KΩ	½	66-4478340	BTS-470K	
R20	2200Ω	½	66-2228340	BTS-2200	
R21	1000Ω	1	66-2104340	BTA-1000	
R22	68Ω	1	66-0684340		
R23	68Ω	1	66-0684340		

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	6.3VCT ②3.58A	380VCT .045A			32-8314-6 32-8314-5 ①					

① Alternate vibrator power transformer.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6.2KΩ CT	3.1Ω	32-8316-10 32-8316-7 ①	Z1004	A-2900	A-3850	22S47	S-51X	① Alternate output transformer

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: PHILCO PART No.	QUAM PART No.	NOTES
SP1	7"	PM	3.1Ω	36-1632-7	7A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Loading Coil	4Ω		32-4422-24	19-1004		6210	5.6 Microhenries, IRC part #CL-1
L2	Ant. Coil	14Ω		32-4641-1				
L3	RF Coil	14Ω		32-4641				
L4	Osc. Coil	.7Ω	7Ω	32-4641-2				
L5	Input IF	37Ω	37Ω	32-4160-17A	16-6752	BC-350	12-H1	
L6	Output IF	40Ω	40Ω	32-4240-12A	16-6754	BC-354	12-H6	
L7	Fil. Choke	0Ω		32-1374-5	19-1001		5221	1.8 Microhenries
L8	Vib. Hash Choke	0Ω		32-4170-4				64 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA: PHILCO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1	Interrupter	6.3V	115∿	83-0025 83-0035 ①	5326	509P	5326	① Alternate vibrator

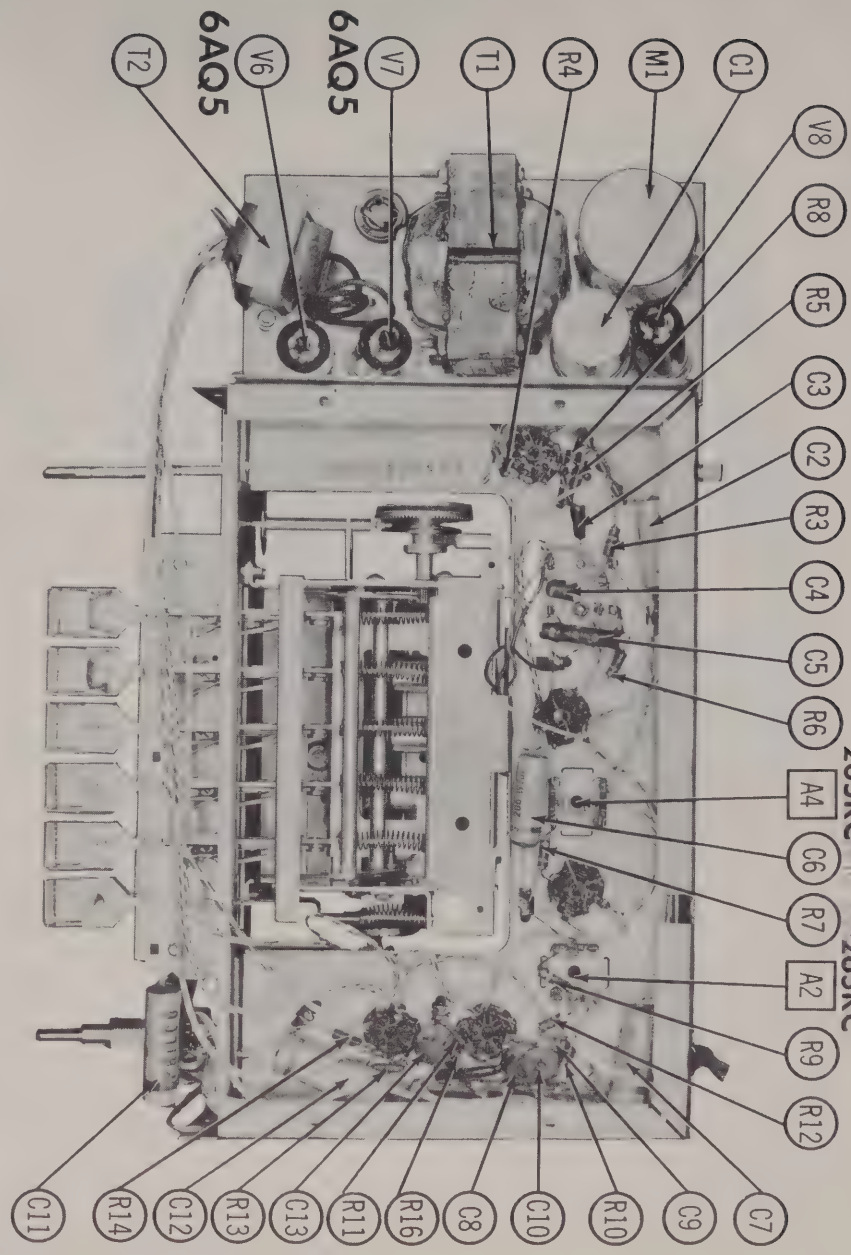
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: PHILCO PART No. FUSE	PHILCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	SFE	14A 32V	AD-2243-4	41-3910-10	307014 (SFE14A)	155014	SFE14	HRI

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Dial Light	34-2064	#44, Bayonet
M4	Dial Light	34-2064	#44, Bayonet
M5	Spark Plate	30-1254	300MMF ("A" Lead)
M6	Spark Plate	30-1235-2	300MMF (Dial Light)
M7	Switch	42-2044	On-off
A5, A7	Trimmer Cap.	31-6522-5	Dual (4 section) Osc. & RF trimmer , also includes fixed capacities (200MMF, RF trap and 60MMF osc. coupling).
A6	Trimmer Cap.	31-6502- 5	Ant. Trimmer
	Knob	28-10341	Tone & fader - Model 832
	Knob	28-10342	Tone & fader - Model 835
	Knob	27-4687-22	Tuning & volume - Model 832
	Knob	27-4687-23	Tuning & volume - Model 835
	Push button	54-6176	6 used - Model 832
	Push button	28-10338-1	6 used - Model 835
	Dial Scale	28-10333	Model 832
	Dial Scale	54-9351	Model 835
	Dial Backplate	28-10331	Model 835 only
	Window	54-6167	Glass
	Pointer Arm Assy.	76-9452	
	Clutch Assy.	76-9451	

CHASSIS—BOTTOM VIEW



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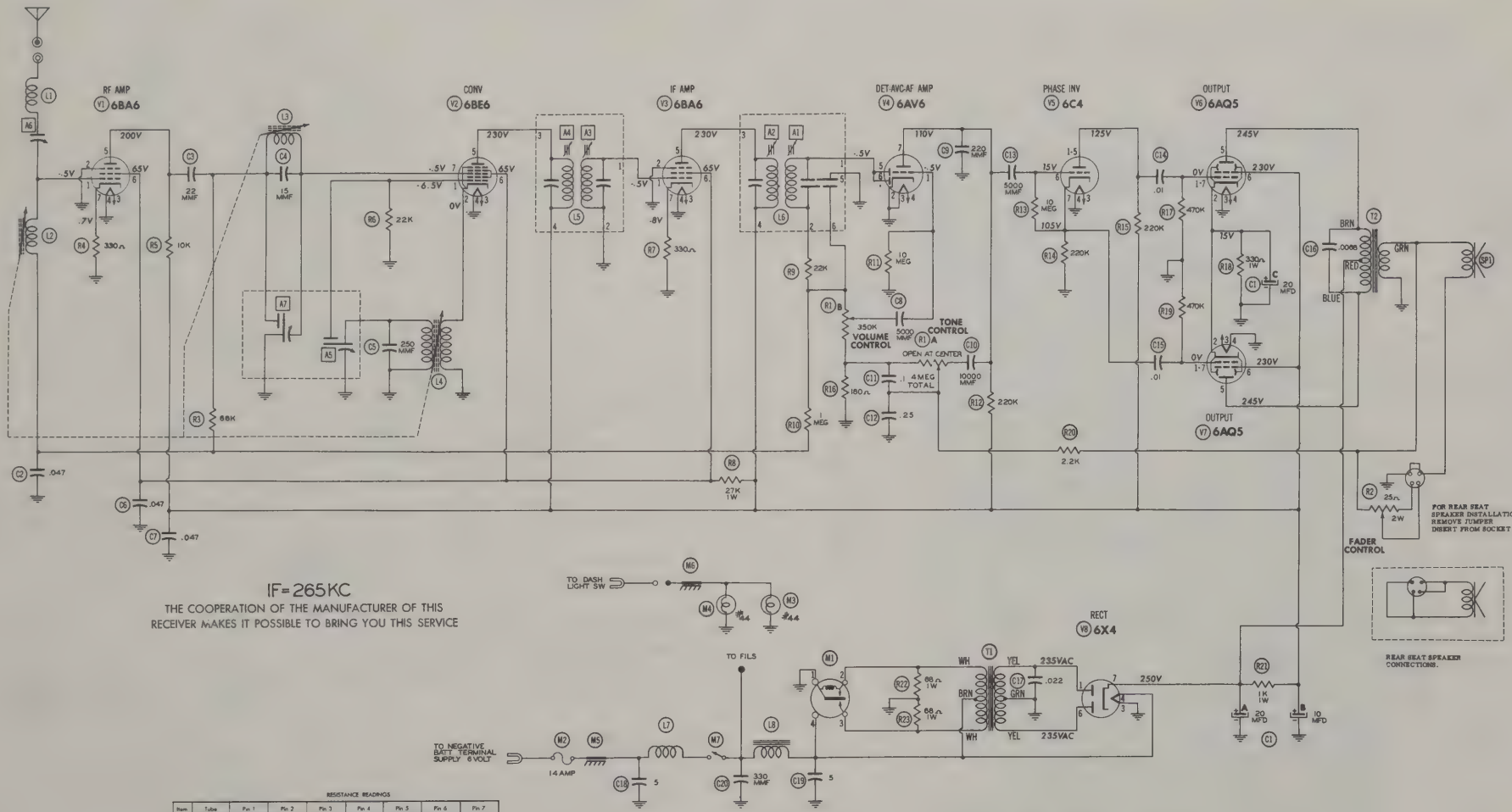
MOPAR MODEL 832

MOPAR MODEL 832



IF = 265 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	1.35Meg	0Ω	.1Ω	0Ω	†1.1KΩ	†28KΩ	330Ω
V 2	6BE6	33KΩ	.1Ω	.1Ω	0Ω	†1KΩ	†28KΩ	1.4Meg
V 3	6BA6	37Ω	0Ω	.1Ω	0Ω	†1KΩ	†28KΩ	330Ω
V 4	6AV6	10Meg	0Ω	0Ω	.1Ω	372KΩ	372KΩ	†22.1KΩ
V 5	6C4	†220KΩ	TP	.1Ω	0Ω	†220KΩ	10.2Meg	220KΩ
V 6	6AQ6	470KΩ	330Ω	0Ω	.1Ω	220Ω	†1KΩ	470KΩ
V 7	6AQ5	470KΩ	330Ω	.1Ω	0Ω	220Ω	†1KΩ	470KΩ
V 8	6X4	400Ω	NC	0Ω	.1Ω	NC	400Ω	90KΩ

† MEASURED FROM PIN 1 OF V8
TP - TIE POINT
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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RCA VICTOR
MODEL 5-C-581 (Ch. RC-1148A)

RCA VICTOR
MODEL 5-C-581 (Ch. RC-1148A)

TRADE NAME	RCA Victor Model 5-C-581 (Ch. RC1148A)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 2, N. J.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 12BA6 (V2). Low side to B-.	455KC (400~ Mod)	Point of non-interference near 1600KC	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to antenna stator terminal lug. Low side to B-.	"	"	"	A3, A4	"
3.		Loop (Radiated)	1620KC	Tuning gang fully open.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400KC	1400KC	"	A6	"
5.		"	600KC	600KC	"	A7	Adjust for maximum output while rocking tuning gang thru 600KC signal.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	80	150	74662			TCD498	TDL-8050-150	FMT-1540	
B	50	150							
C2	.047	400	73553	DF-503		PT4147	IMP4-S47	3304147	
C3	56		75784	D6-560	831-560	UC-5456		K-1456	
C4	4.7		77471	TCZ-4R7	NP0A-4R7				
C5A	220								
B	5000								
C	5000		♦79058	♦PC-151	♦1408-02				
D	250								
E									
C6	.015	400	74797	DD16-153	821-015	PT6115	IMP6-S15	3306115	
C7	.047	400	75071	DF-503		PT4147	IMP4-S47	3304147	
C8	.1	400	73551	DF-104		PT401	IMP4-P1	330401	
C9	.1	400	73551	DF-104		PT401	IMP4-P1	330401	

♦ Items C5A, C5B, C5C, C5D, C5E, R7A, R7B and R7C are combined in one unit.
When replacing items separately, C5D and C5E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	79945	Q13-137	A47-1Meg-Z	B-70	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	33KΩ	½	503333	BTS-33K	
R3	100Ω	½	503110	BTS-100	
R4	100Ω	½	503110	BTS-100	
R5	47KΩ	½	503347	BTS-47K	
R6	3.3Meg	½	503533	BTS-3.3Meg	

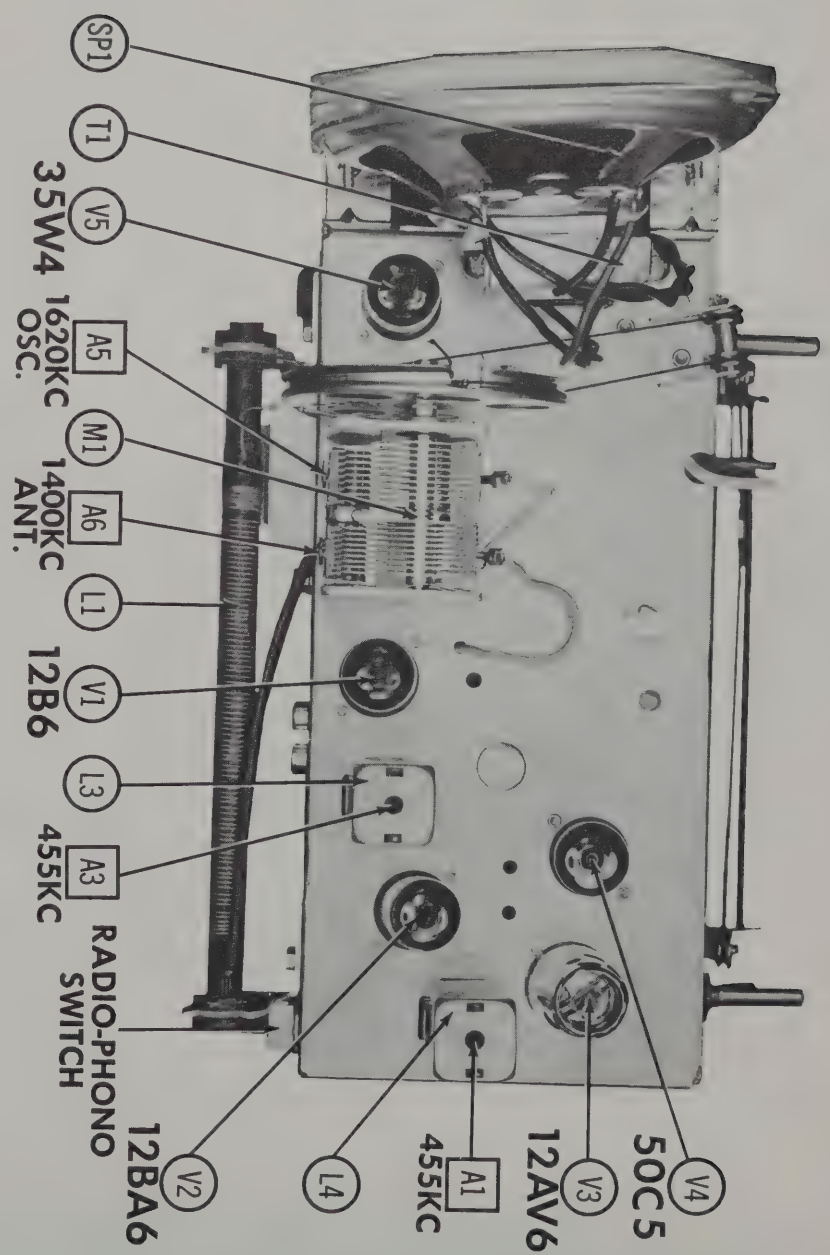
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R7A	6.8Meg	½	♦79058	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R8	150Ω	½	503115	BTS-150	
R9	1200Ω	1	512212	BTA-1200	
R10	33Ω	1	513033		

♦ Items R7A, R7B, R7C, C5A, C5B, C5C, C5D and C5E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: RCA Victor PART No.	Hallidorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.4KΩ	3.4Ω	79283	21102 ①	A-3031 ①	A-3336 ①	24S50A ①	S-16X	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω	76402	4A07	

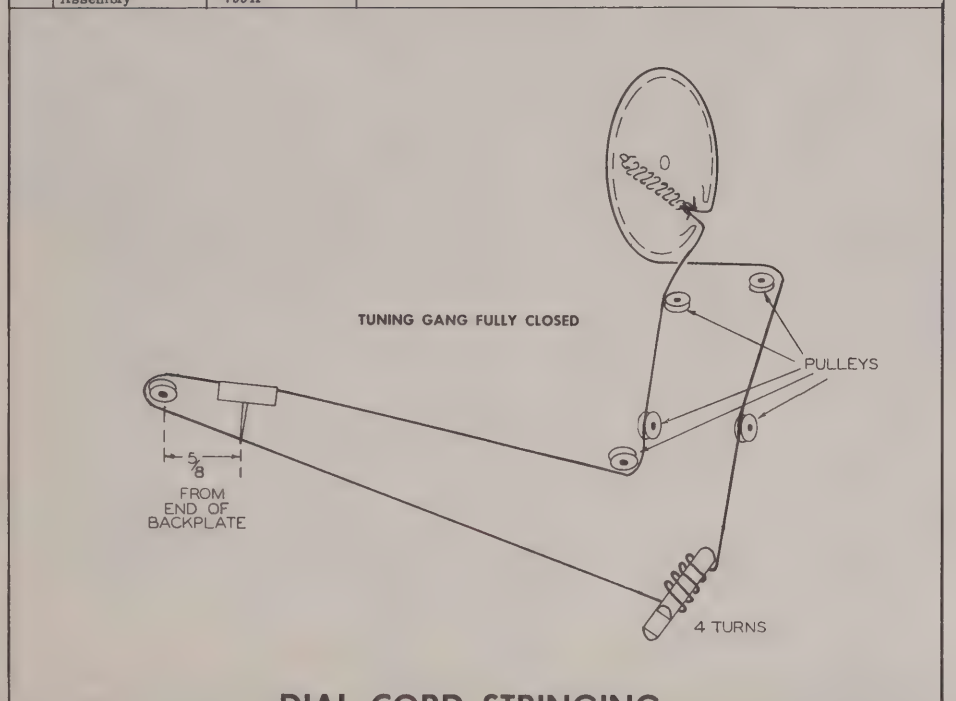
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.4Ω		79965				
L2	Osc. Coil	.6Ω	5.5Ω	79947	14-1074*	BC-394	71-Osc.	
L3	Input IF	16Ω	16Ω	75486	16-6758	BC-352	12-C1	
L4	Output IF	14Ω	14Ω	75487	16-6770	BC-355	12-C6	

* Leads sufficient mounting support.

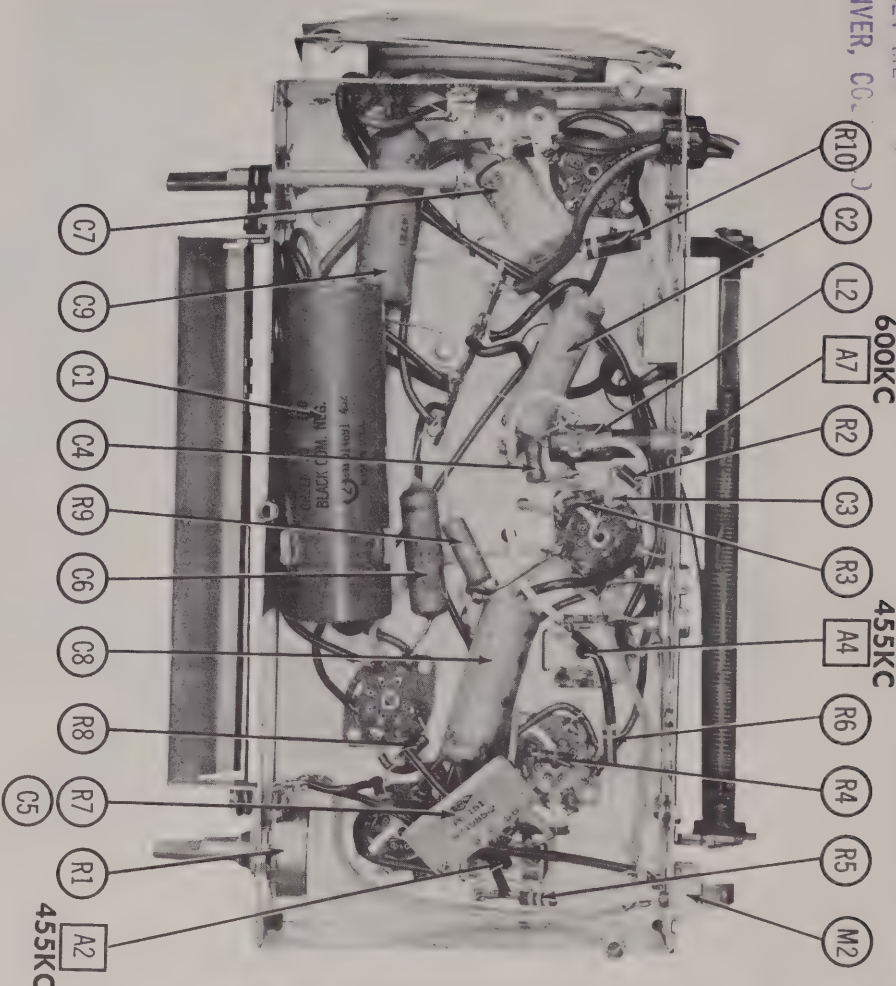
MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Tuning Cap.	79949	2 Gang (16-260MMF; 16-130MMF)
M2	Switch	79256	Radio-Phono (SPDT Slidetype)
	Case	79926	Back Case Assembly (Hood)
	Case	79955	Front Case & Bezel Assembly (Cradle)
	Knob	79927	Sleep-Buzzer
	Knob	79943	Tuning/Volume
	Knob	79934	Time Set
	Dial Pointer	79942	
	Dial Backplate Assembly	79941	



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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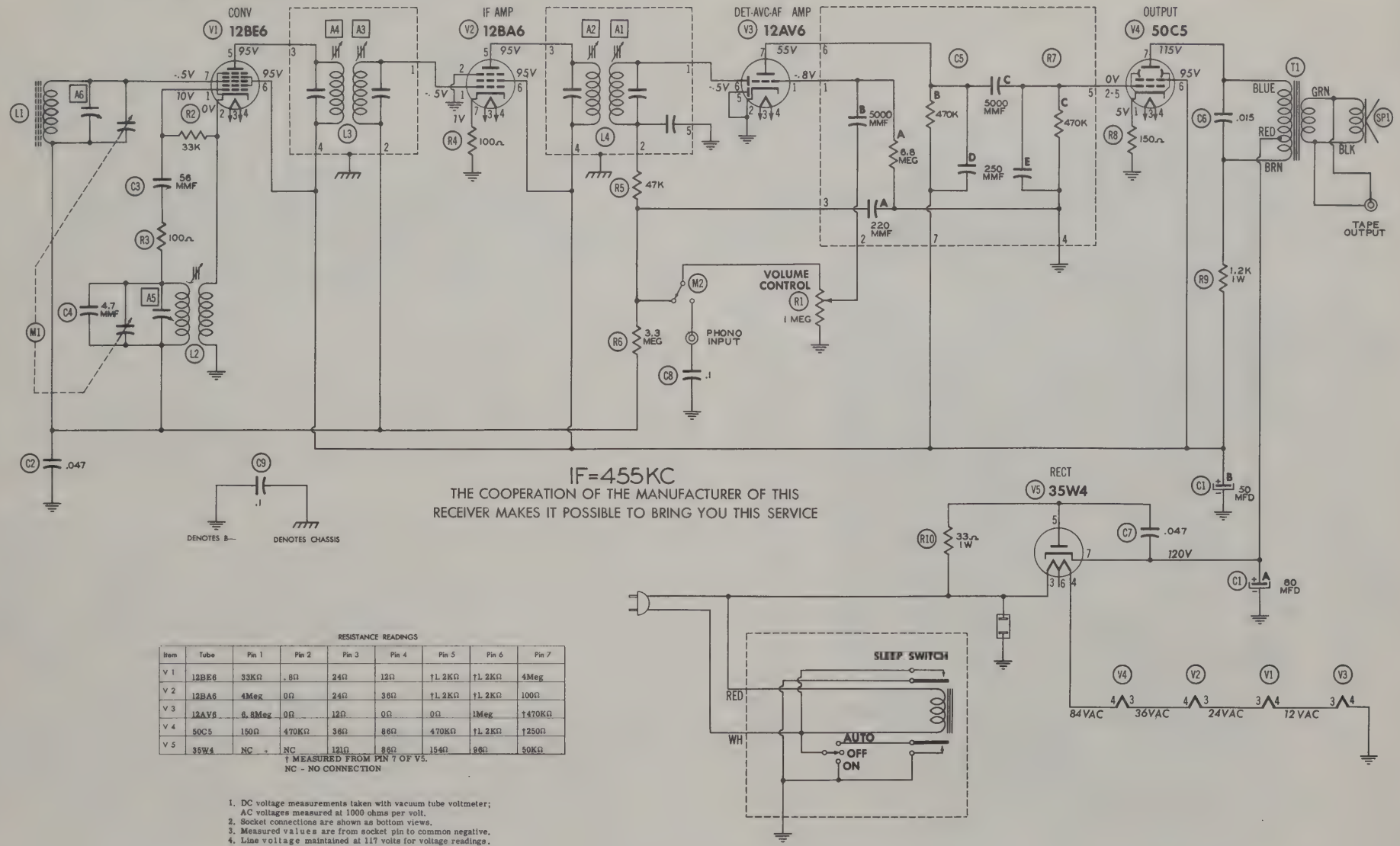
RCA VICTOR
MODEL 5-C-581 (Ch. RCU148A)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	33KΩ	.8Ω	24Ω	12Ω	†1.2KΩ	†1.2KΩ	4Meg
V 2	12BA6	4Meg	0Ω	24Ω	36Ω	†1.2KΩ	†1.2KΩ	100Ω
V 3	12AV6	6.8Meg	0Ω	12Ω	0Ω	0Ω	1Meg	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1.2KΩ	†250Ω
V 5	35W4	NC	NC	121Ω	86Ω	154Ω	96Ω	50KΩ

† MEASURED FROM PIN 7 OF V5.
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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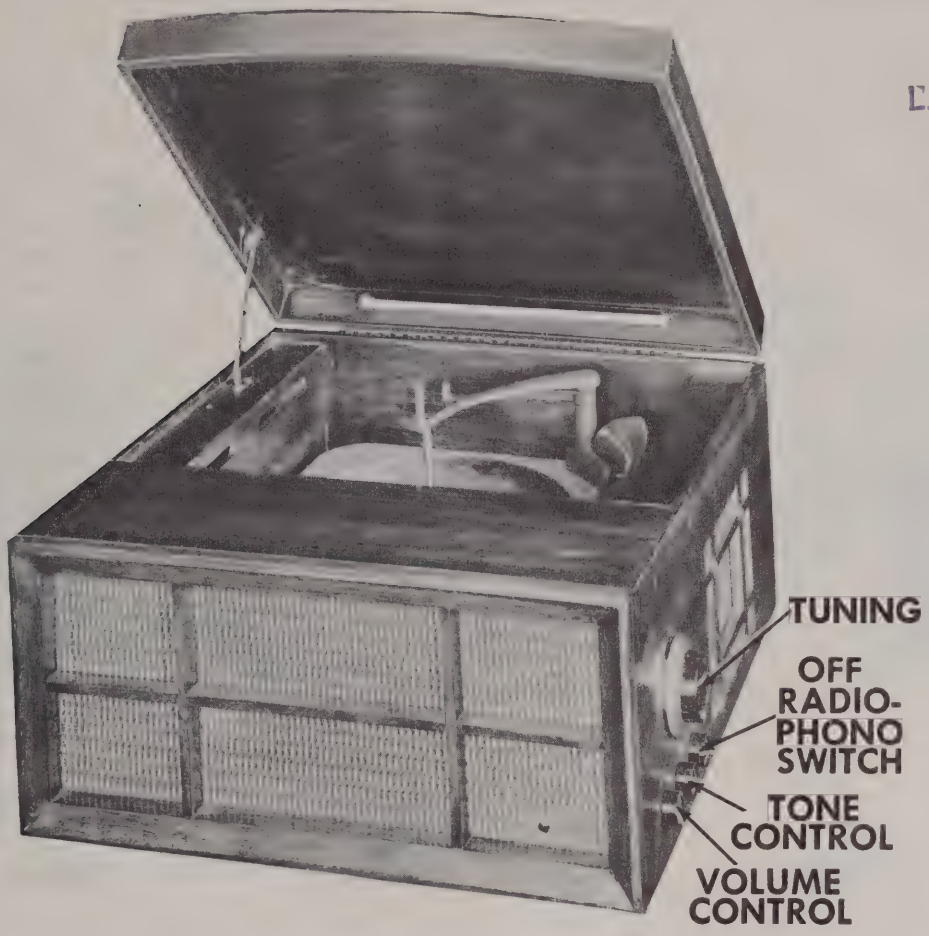
SENTINEL
MODELS 1U-357, 1U-358



SENTINEL
MODELS 1U-357, 1U-358

TRADE NAME	Sentinel Models 1U-357, 1U-358
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dempster St., Evanston, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver With 3 Speed Automatic Record Changer
TUBES (Seven)	Types 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-1st AF Amp., 12AU7 2nd AF Amp.-Phase Inverter (2) 6AQ5 Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .52 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to antenna stator lug. Low side to chassis.	455KC (400∿Mod)	Point of non-interference	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	1620KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	"

RECORD CHANGER UNIT - WEBSTER-CHICAGO MODEL 113

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	6BE6	6BE6	7CH	
V2	IF Amplifier	6BA6	6BA6	7BK	
V3	Det.-AVC-1st. AF Amp.	6AV6	6AV6	7BT	
V4	2nd. AF Amp.-Phase Inverter	12AU7	12AU7	9A	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SENTINEL PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	30	350	25E80			FP376-.8	TM-404010-450	T-165	Yellow
B	30	350							Red
C	10	350							Blue
C2	50	15	25E81			TC29	TD-50-25	FM-0250	
C3	200		23E4000-29	D6-201	GP2K-201	UC-532		K-1320	
C4	.047	200	23E3214	DF-503		PT4147	IMP2-S47	3302147	
C5	.1	400	23E3416	DF-104		PT401	IMP4-P1	330401	
C6	30		♦23E2022-4	TCZ-30	831-300			K-1430	
C7	.047	200	23E3214	DF-503		PT4147	IMP2-S47	3302147	
C8A	100		†23E2022	PC-50	1403-01	UC-531		K-1310	
B	100					UC-531		K-1310	
C9	470		23E4004-1	DD-471	811-471	UC-5347			
C10	10000		23E4004-17	DD-103	811-01	DC-511	IMP6-S1	330611	
C11	.0033	400	23E3407	D6-332	GP2-333-332	PT6233	IMP6-D33	3306233	
C12	100		23E4000-17	D6-101	GP1K-101	UC-531		K-1347	
C13	.0022	400	23E3406	D6-222	GP2-333-222	PT6222	IMP6-D22	3306222	
C14	20000		23E4004	DD-203	817-02	PT412	IMP6-S2	330612	
C15	.047	200	23E3214	DF-503		PT4147	IMP2-S47	3302147	
C16	100		23E4000-17	D6-101	GP1K-101	UC-531		K-1310	
C17	.047	400	23E3414	DF-503		PT4147	IMP4-S47	3304147	
C18	.1	400	23E3416	DF-104		PT401	IMP4-P1	330401	
C19	100		23E4000-17	D6-101	GP1K-101	UC-531		K-1310	
C20	.033	400	23E3413	D6-332	GP2-333-222	PT6233	IMP6-S33	3306133	
C21	.033	400	23E3413	D6-332	GP2-333-222	PT6233	IMP6-S33	3306133	
C22	470		23E4004-1	DD-471	811-471	UC-5347		K-1347	
C23	470		23E4004-1	DD-471	811-471	UC-5347		K-1347	
C24A	10000		23E2037-6	DD3-103	811-01	DC-511	IMP6-S1	330611	
B	10000				811-01	DC-511	IMP6-S1	330611	

♦ Items C6 and R4 are combined in one unit.
† Items C8A, C8B and R9 are combined in one unit.

CONTROLS

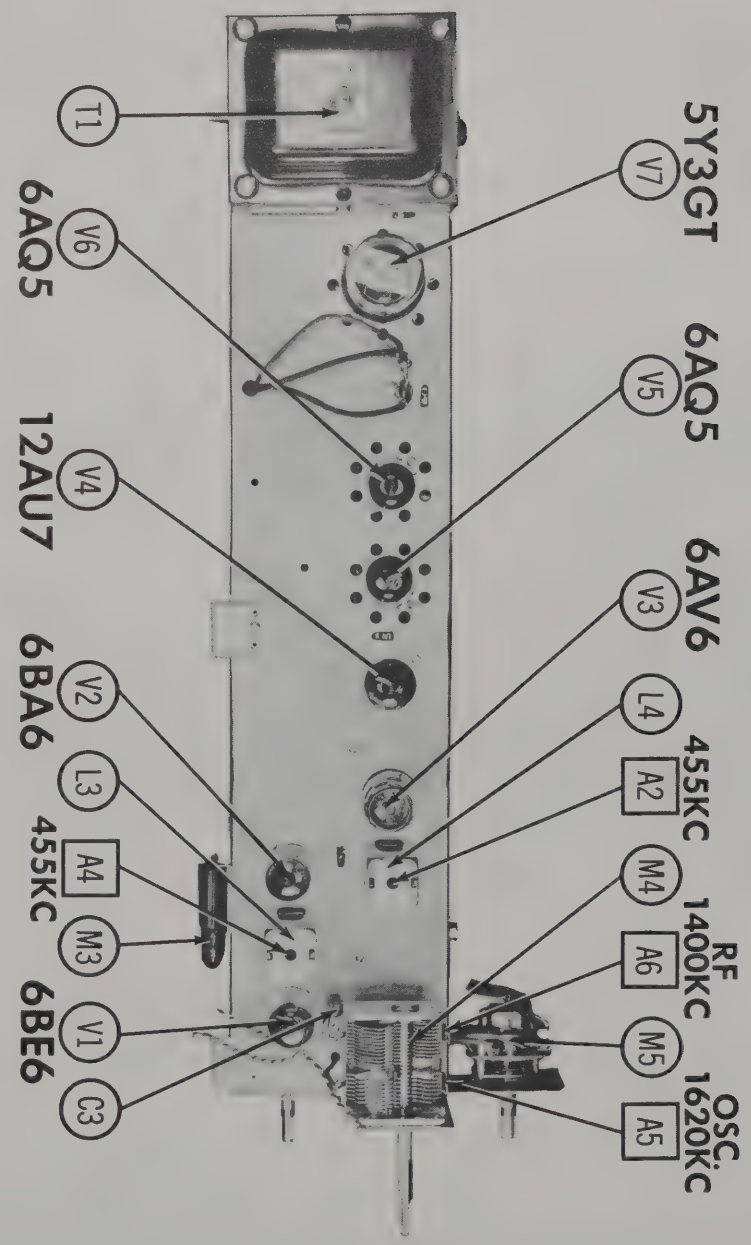
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SENTINEL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	28E114	Q13-137	A47-1Meg-Z	AB-70	U-53	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2	1Meg	½	28E115					Volume-tapped @ 100KΩ and 200KΩ

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SENTINEL PART No.	IRC PART No.	NOTES
R3	47Ω	½	27E470K-½	BTS-47	
R4	22KΩ	½	♦23E2022-4	BTS-22K	
R5	1Meg	½	27E105M-½	BTS-1Meg	
R6	18KΩ	1	27E183K-1	BTA-18K	
R7	1Meg	½	27E105M-½	BTS-1Meg	
R8	47Ω	½	27E470K-½	BTS-47	
R9	47KΩ	½	†23E2022	BTS-47K	
R10	220KΩ	½	27E224M-½	BTS-220K	
R11	4.7Meg	½	27E475M-½	BTS-4.7Meg	
R12	220KΩ	½	27E224M-½	BTS-220K	
R13	100KΩ	½	27E104M-½	BTS-100K	
R14	15KΩ	½	27E153K-½	BTS-15K	
R15	15KΩ	½	27E153K-½	BTS-15K	
R16	47KΩ	½	27E473K-½	BTS-47K	
R17	100KΩ	½	27E104M-½	BTS-100K	
R18	3300Ω 5%	½	27E332K-½	BTS-3300 5%	
R19	220KΩ	½	27E224M-½	BTS-220K	
R20	22KΩ	½	27E223K-½	BTS-22K	
R21	22KΩ	½	27E223K-½	BTS-22K	
R22	470KΩ	½	27E474M-½	BTS-470K	
R23	220Ω	1	27E221K-1	BTA-220	
R24	470KΩ	½	27E474M-½	BTS-470K	
R25	4700Ω	1	27E472K-1	BTA-4700	
R26	2200Ω	1	27E222K-1	BTA-2200	
R27	3.3Ω	2	27E1015-4		Note 1

♦ Items R4 and C6 are combined in one unit.
† Items R9, C8A, C8B are combined in one unit.
Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.52A	525VCT .078ADC	5VAC @ 2A	6.3VAC @2.2A	22E96		P-3052 ②	PM-8404 ②		R-10B ① ②

Note 1. Drill new mounting holes.
Note 2. Tape 6.3VCT.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6.7KΩ CT	1.16Ω	22E95	Z1011	A-2905 ①	A-3825	22S46 ①	S-55X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SENTINEL PART No.	QUAM PART No.	
SP1	5"	PM	3.3Ω	1E58-2	5A1	① Used in Model 1U-358
SP2	6"	PM	3.6Ω	1E59	6A1LF	
SP3	6"	PM	3.6Ω	1E59	6A1LF	
	12"	PM	3.3Ω	1E60 ①	12A31	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SENTINEL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.5Ω		20E971				
L2	Osc. Coil	1.1Ω	10Ω	20E938		BC-394	70-OSC	
L3	Input IF	14Ω	14Ω	20E732	16-6758	BC-352	12-C1	
L4	Output IF	9.5Ω	9.5Ω	20E763	16-6758	BC-353	12-C2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SENTINEL PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		55-T	GD-J	47	0-1 or S-1 & 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	SENTINEL PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		*S-67 or †S-66 or ♦†S-66SD or ♦S-66D	†AC-434 or ♦†AC-434D1 or †SAC-434D2 or ♦AC-434D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond

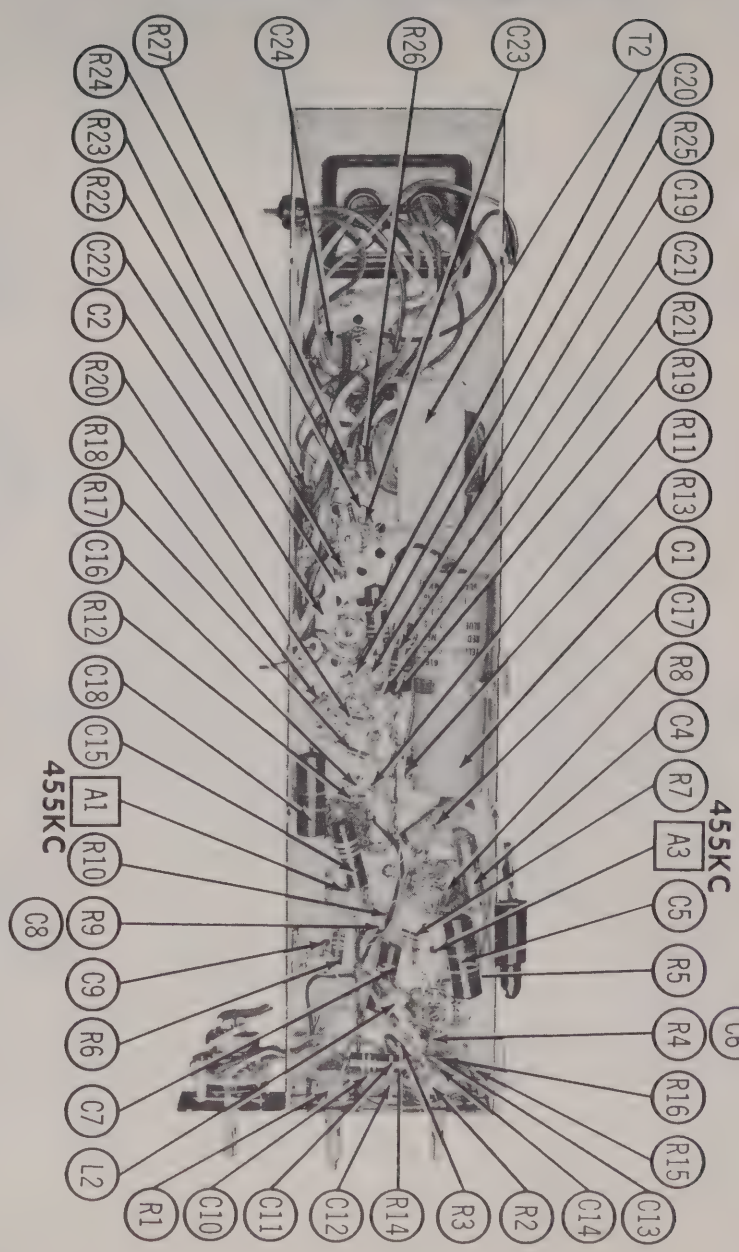
MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M3	Pilot Light	40E1	#47
M4	Tuning Cap.	24E65	2 Gang (13-320MMF, 13-105MMF)
M5A	Switch	29E34	On-off (power)
B	Switch		Phono-Radio (Rotary-wafer type)
	Knob	37E91	Volume and tone
	Knob	37E91-2	On-off & phono-radio switch
	Knob	37E92	Tuning
	Dial & Hub Assy.	20E973	

SET 284 FOLDER 12

SENTINEL MODEL 1U-357

CHASSIS—BOTTOM VIEW



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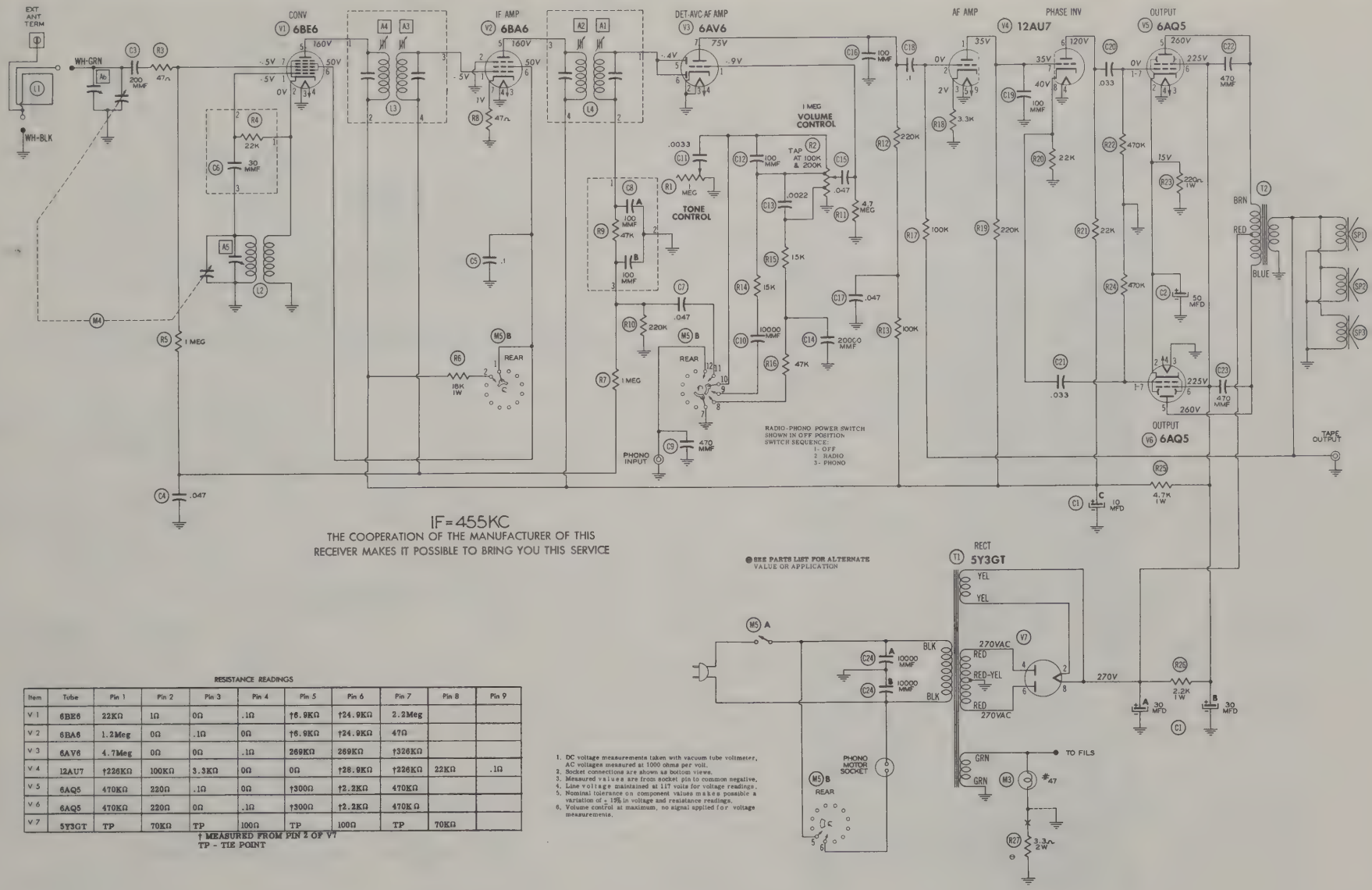
SENTINEL MODEL 1U-357



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BE6	22KΩ	1Ω	0Ω	.1Ω	†6.9KΩ	†24.9KΩ	2.2Meg		
V 2	6BA6	1.2Meg	0Ω	.1Ω	0Ω	†6.9KΩ	†24.9KΩ	47Ω		
V 3	6AV6	4.7Meg	0Ω	0Ω	.1Ω	269KΩ	269KΩ	†326KΩ		
V 4	12AU7	†226KΩ	100KΩ	3.3KΩ	0Ω	0Ω	†28.9KΩ	†226KΩ	22KΩ	.1Ω
V 5	6AQ5	470KΩ	220Ω	.1Ω	0Ω	†300Ω	†2.2KΩ	470KΩ		
V 6	6AQ5	470KΩ	220Ω	0Ω	.1Ω	†300Ω	†2.2KΩ	470KΩ		
V 7	5Y3GT	TP	70KΩ	TP	100Ω	TP	100Ω	TP	70KΩ	

† MEASURED FROM PIN 2 OF V7
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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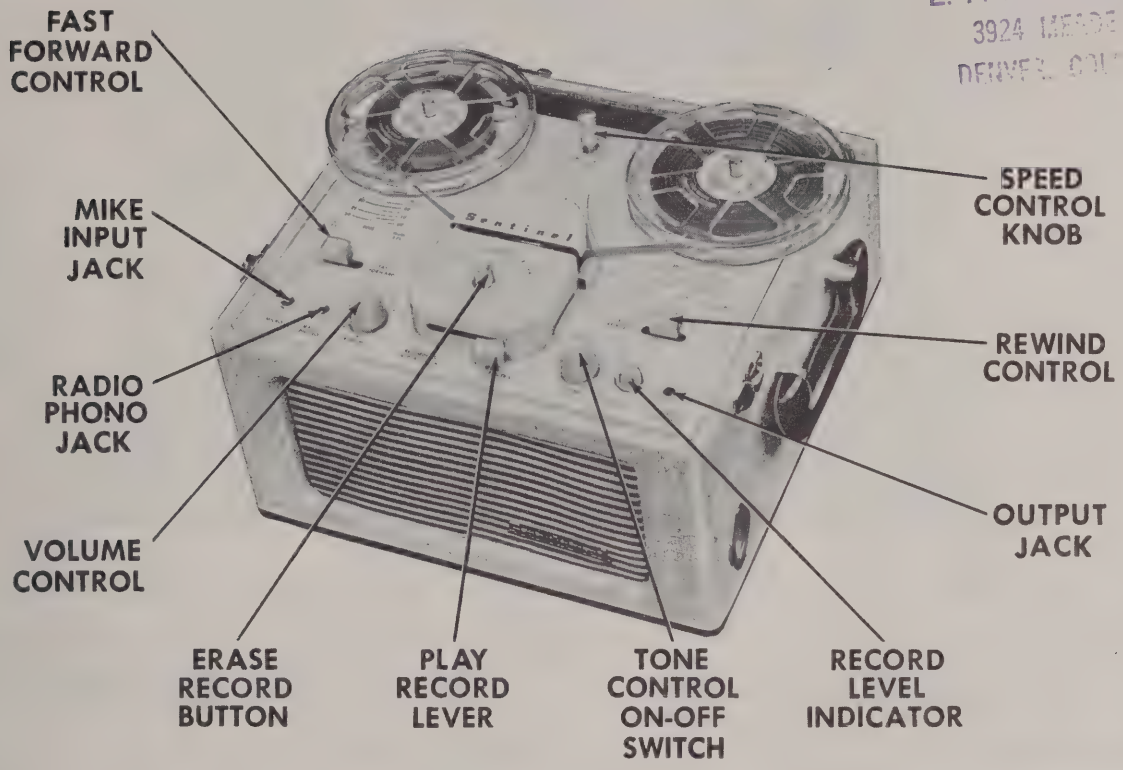

Figure 1

GENERAL INFORMATION

The Sentinel Model 10 Tape Recorder is designed to record and play back two tracks of material on standard width recording tape, which doubles the recording and playing time with no loss of frequency response or quality. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from the microphone.

Model 10 has two tape speeds, 3 3/4" and 7 1/2" per second. Using both tracks of the tape, the recording time is as follows:

SIZE REEL	3 3/4" SPEED	7 1/2" SPEED
5"	1 hour	1/2 hour
7"	2 hours	1 hour

Connect this recorder to an outlet supplying 110-120 volts, 60 cycle AC only. Before connecting to your line supply, be absolutely certain that it agrees with the above specifications.

Sentinel Radio Corporation
2100 W. Dempster Street
Evanston, Illinois

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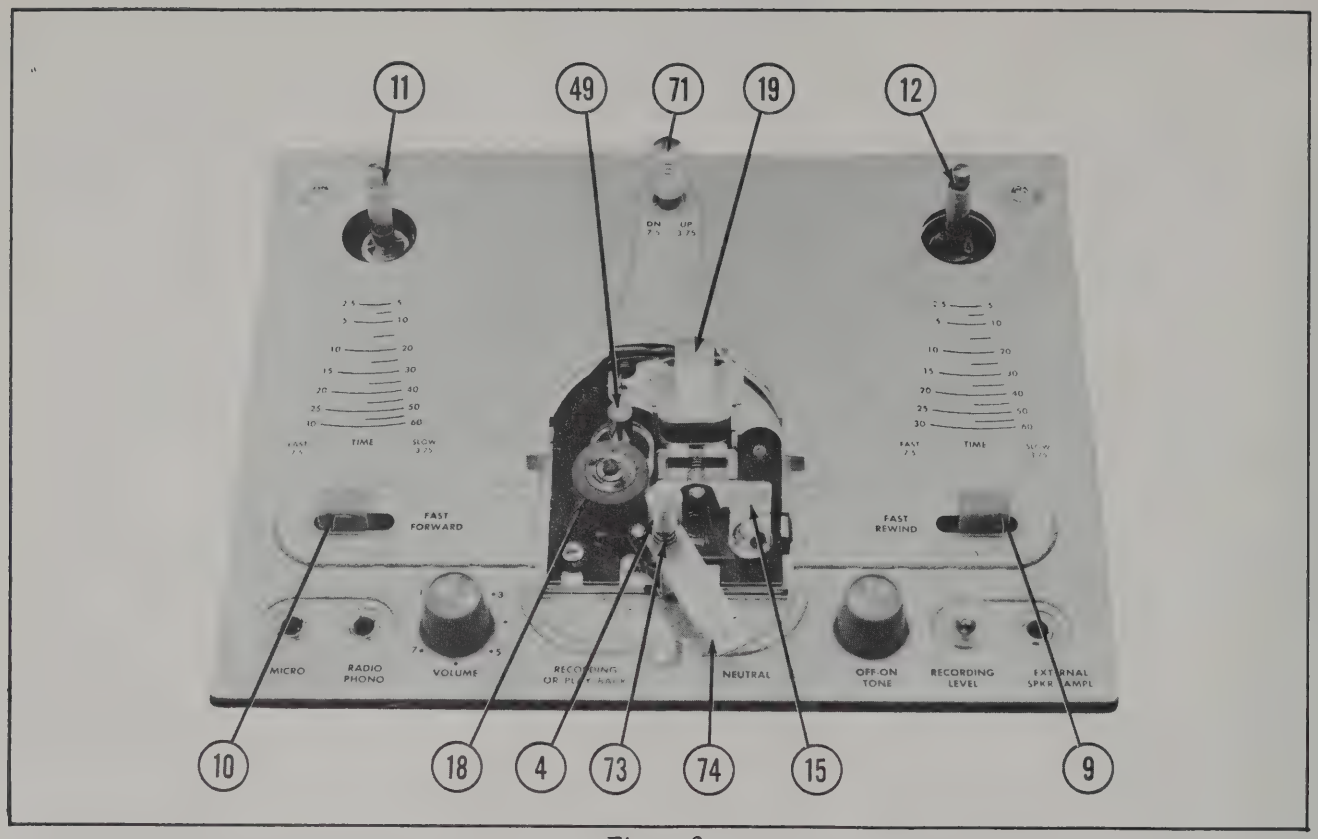

Figure 2

SPECIFICATIONS

Fast Forward Speed-

5" reel, 45 seconds.
7" reel, 90 seconds.

Fast Rewind Speed-

5" reel, 45 seconds.
7" reel, 90 seconds.

Frequency Response-

3 3/4" speed, 65 to 6000 cycles per sec.
7 1/2" speed, 65 to 8500 cycles per sec.

Power Output-

2 watts undistorted
3 watts maximum

Inputs-

Microphone, 1 Meg. Impedance
Radio-Phono, .5 Meg. Impedance.

Outputs-

Internal 5" Speaker.
External 3.2 Ohm Speaker.
External high impedance output for Ext. Amp. or Monitor in Record or Playback position.
External-Low impedance across 3.2 Ohm voice coil for Ext. Spkr.

Bias & Erase Frequency-

50 K.C.

OPERATING INSTRUCTIONS

Speed Control-

Changing speeds is accomplished by placing the speed button in the "Up" or "Down" position. "Up" for 3 3/4" per second and "Down" for 7 1/2" per second.

CAUTION: Do not operate this control unless the On-Off control is in the "On" position.

Threading The Tape-

1. Place a reel of tape on the right reel plate (7) and an empty reel on the left reel plate (2) making sure the reel slots engage the pins on the reel plates.

2. Unwind about 10" of tape from the reel. Hold a section of the tape straight with both hands and insert the tape in the tape slot making sure the dull coated side faces the rear of the recorder.

3. Insert the free end of the tape into one of the three radial slots in the hub of the empty reel. Turn the reel several turns, clockwise, until the tape is secured to the reel and all slack is taken up between reels.

To Record From Microphone-

1. Turn the On-Off Tone Control clockwise until a click is heard and allow about thirty seconds for the tubes to warm up.

2. Insert the microphone plug into the "Mike" jack.

3. Depress record button (4) as far as it will go while moving control lever (74) to extreme left position.

4. Hold the microphone about six inches from your mouth and speak in a normal voice. Adjust the

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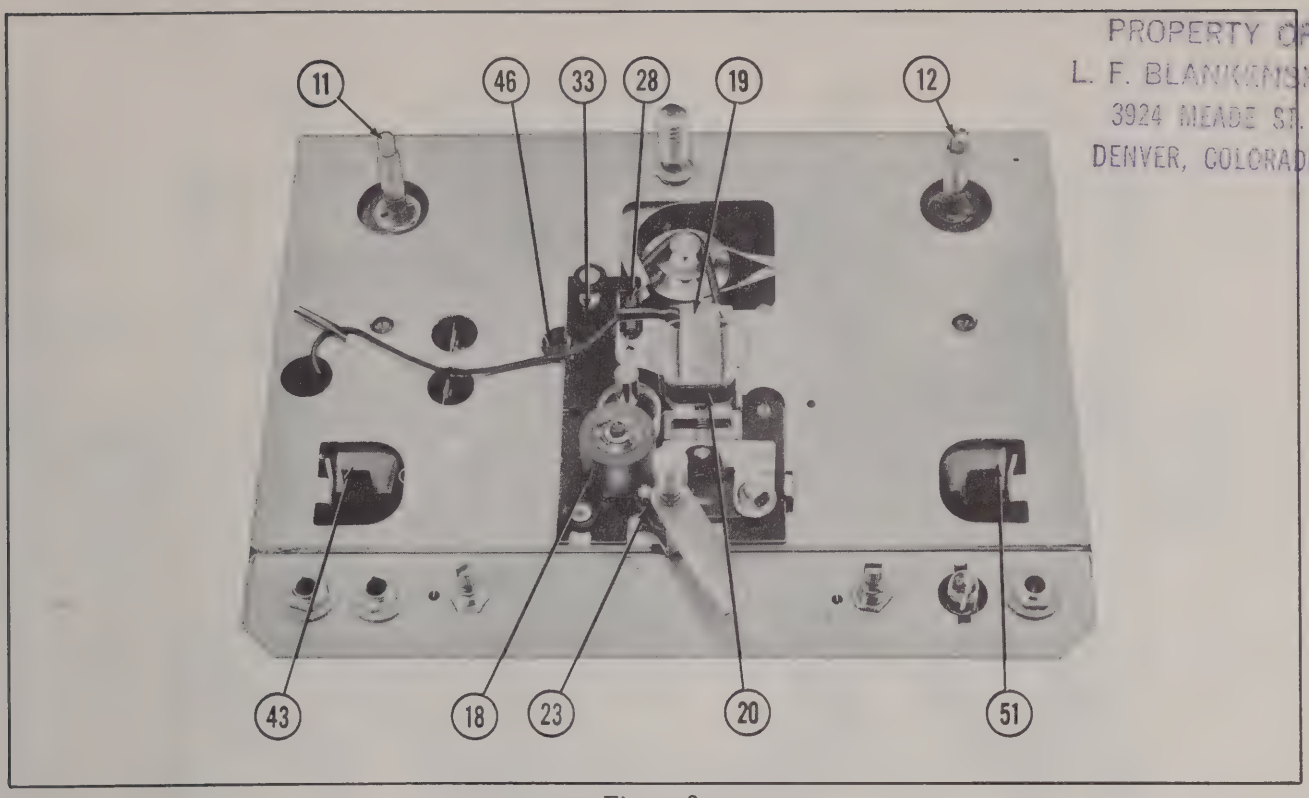


Figure 3

"Volume" control until the record level indicator flashes on the loudest sounds.

NOTE: Correct recording volume is very important. Too weak a signal, which does not cause the record level indicator to flash, will result in weak playback and high background noise. Too strong a signal, causing the level indicator to flash continuously, will result in distortion during playback.

To Record From Radio-

Recordings from a radio may be made by one of three ways:

1. Place the microphone about 6" to 12" in front of the radio speaker. Turn the radio volume control to a normal level. Setting it too high will cause distortion. Turn the radio tone control to maximum treble. Set the recording level and proceed with recording as described under "To Record From Microphone". This type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result will be recorded on the tape.

2. Have a shielded cable made up with a two conductor phone plug on one end and two alligator clips on the other end. Connect the alligator clips across the voice coil terminals on the radio speaker and insert the cord plug into the "Radio-Phono" jack. Set the radio volume and tone controls as described above. Set the recording level and proceed as described under "To Record From Microphone".

3. Have a shielded cable with a two conductor phone plug on one end and the other end connected across the radio volume control. Insert the phone plug into the "Radio-Phono" jack. Set the recording level and proceed with the recording as described under "To Record From Microphone". The position of the radio volume and tone controls has no effect on this set up and may be set anywhere.

To Record From Phonograph-

1. If the phonograph being used has a phone type plug on the pickup leads, insert it into the "Radio-Phono" jack. Set the recording level and proceed with the recording as described under "To Record From Microphone".

2. If the phonograph has a standard pin type plug which is more common, an adaptor is needed. Insert the pin plug into the adaptor and plug the adaptor into the "Radio-Phono" jack.

IMPORTANT: The recorder will not record from microphone or play back while a plug is inserted in the "Radio-Phono" jack.

To Record From Television Receiver-

1. Use one of the three methods described under "To Record From Radio" and proceed with the recording as described under "To Record From Microphone".

Dual Track Recording-

The Sentinel is designed so that only one-half the tape width is recorded at a time; thereby resulting in two track recording. This two track operation is accomplished in the following manner:

1. After a reel of tape has been recorded, i.e. all of the tape wound on to the take-up reel, turn control lever (74) to neutral.

2. Remove the reels from the recorder, turning the full reel over and placing it on the right reel plate (7) and the empty reel on the left reel plate (2).

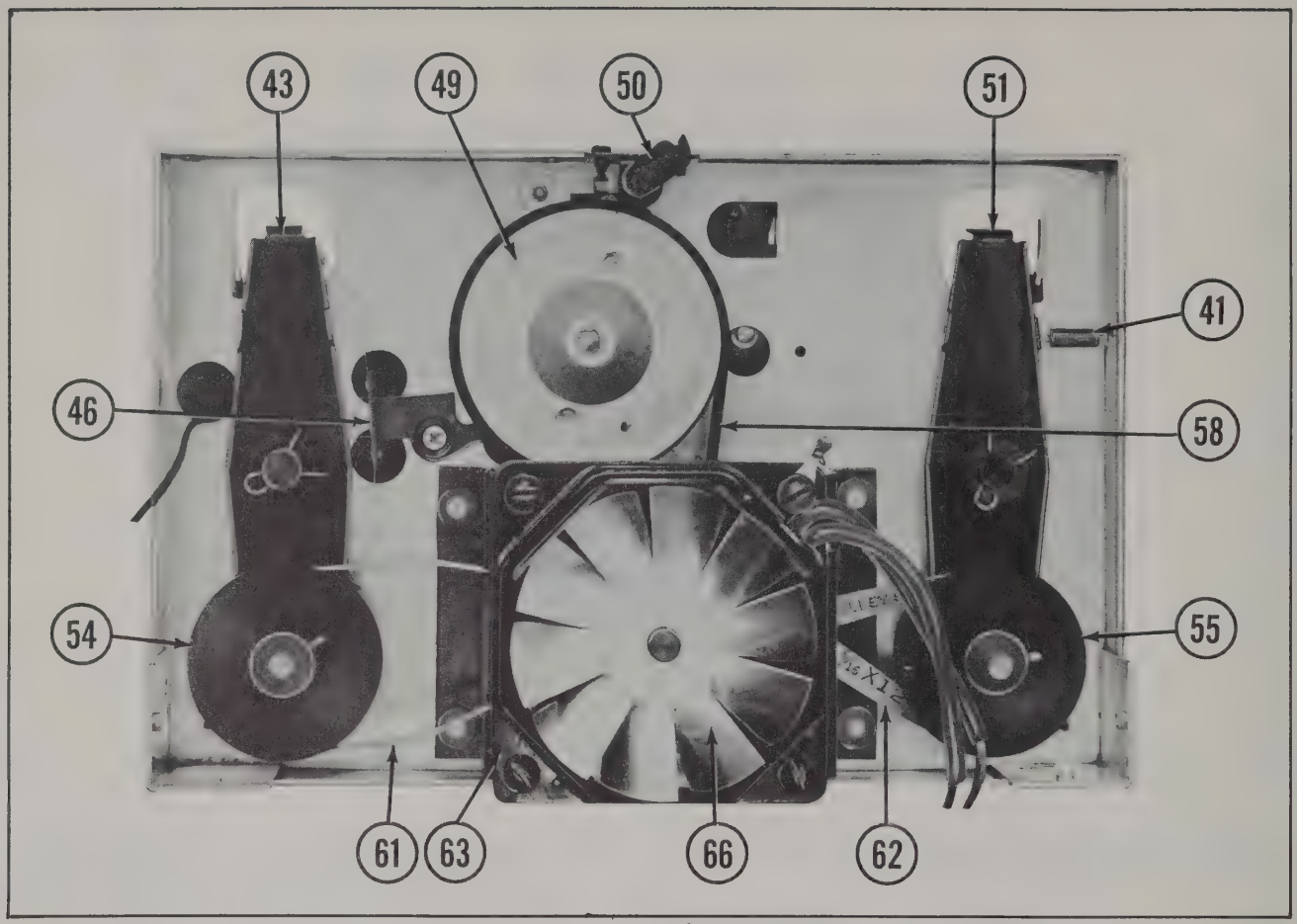


Figure 4

3. Properly thread the tape and proceed with the recording.

4. After this track has been recorded the first track of recording is ready to be played without rewinding, by reversing the reels as described in step 2 above.

Fast Forward And Fast Rewind-

High-speed forward or reverse can be obtained by pressing the desired knob (9 or 10) toward the head cover. Movement of these controls will wind the tape on the desired reel at a high speed as long as the control is held in this position. These are used primarily in locating a desired portion of a recording in a few seconds.

CAUTION: Do not attempt "Fast Forward" or "Fast Rewind" with control lever (74) in any position but neutral, as damage to the unit or breaking of the tape may result.

Braking-

The Sentinel is equipped with a quick stop when in high speed, either direction. Move both "Fast Forward" and "Fast Rewind" controls toward the head cover and then release both at the same time. For example: when in fast forward speed, continue to hold control and with the other hand move "Fast Rewind" control toward head cover. When machine stops, release both controls at the same time. If a coasting stop is desired, release control in motion and tape will glide to a momentum stop.

To Play A Recording-

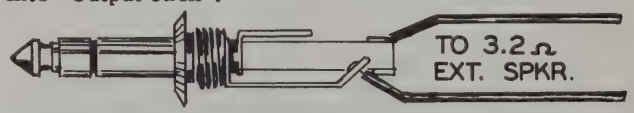
1. Thread tape as described under "Threading the Tape".

2. Move control lever (74) to the right without depressing record button (4).

3. Adjust the "Volume" and "Tone" controls for desired listening level.

To Use An Ext. Speaker-

Plug external speaker thru a three conductor plug into "Output Jack".



CAUTION: Do not insert plug into recorder without ext. speaker attached.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

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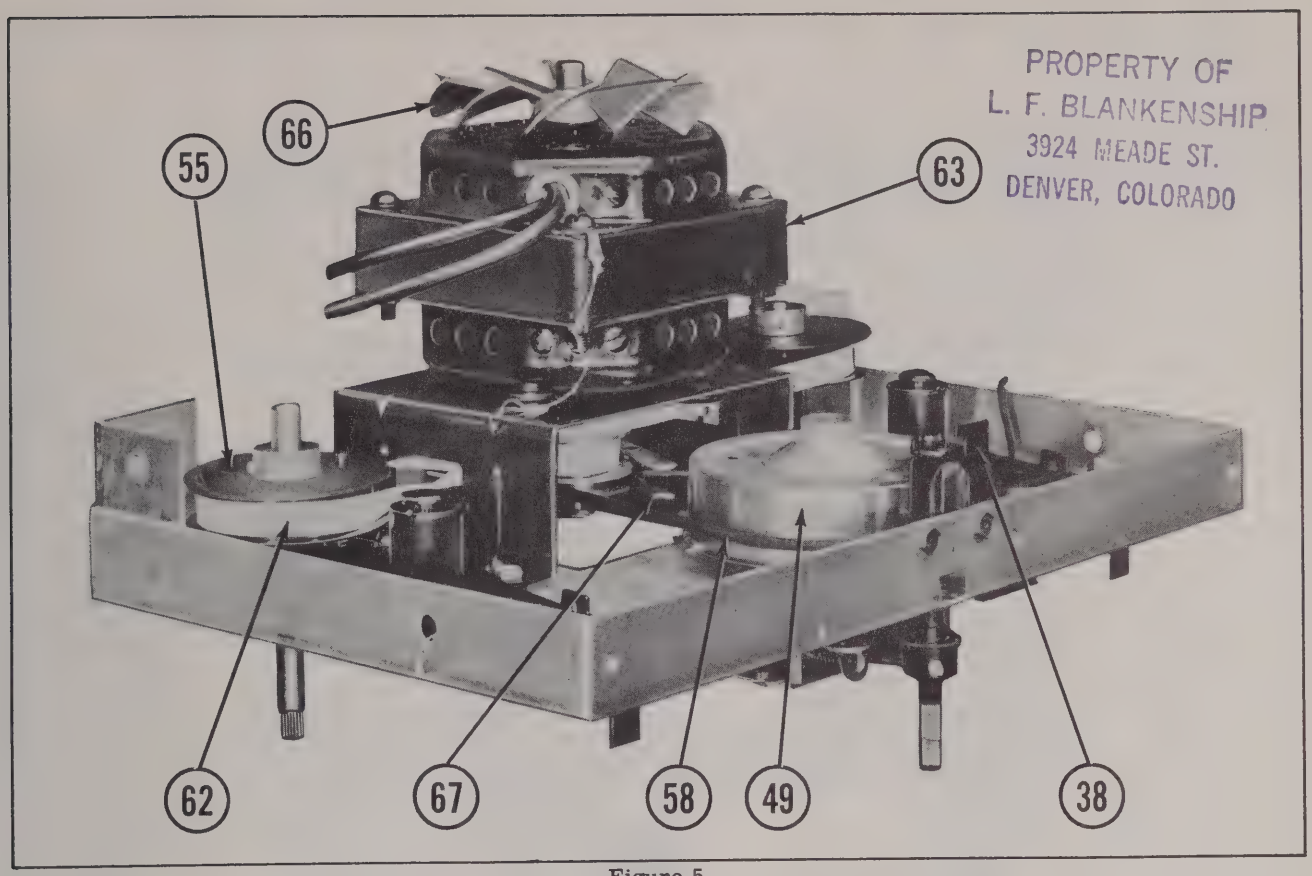

Figure 5

Erasing Recorded Material-

In the record position any recording on the tape is automatically erased before a new recording is put on the tape. If it is desired to erase a recording without putting anything on the tape follow the normal recording procedure, but leave the "Volume" control set at its extreme counterclockwise position.

To Use As A Public Address System-

1. Insert the microphone plug into the "Radio-Phono" jack.

2. Leave control lever (74) in the neutral position.

3. Speak into the microphone and adjust the "Volume" and "Tone" controls for desired level.

4. Do not have the microphone too close to the speaker or a feedback howl will result.

ADJUSTMENTS

Removing Unit From Case-

All service work except cleaning of the head and pressure roller and adjustment of the head and pressure pad assembly requires removal of the unit from the carrying case.

1. To remove unit from carrying case, disconnect power cord and remove the four Phillips head screws from bottom of case and carefully lift unit straight up and out.

Spindle (11 and 12) End Play Adjustments-

The spindles should have from 1/32" to 1/16" of up and down movement. Loosen the set screw in the pulley (54 or 55) and move the pulley up or down until the correct amount of end play is obtained.

Take Up Spring (46) Adjustment-

Place a full 7" reel of tape on the take up reel plate (2). Rewind on the feed reel for about 10 seconds. Place the unit in the "Play" position. The take up reel should start revolving at the same time or a little after the capstan and pressure roller (18) start pulling tape. There should be no looping of the tape before it starts to take up. If the tape loops or doesn't take up at all, bend the take up lever spring (46) at point "A" on exploded view until the recorder takes up properly. Bending the spring outward will increase the take up while bending inward will decrease it.

CAUTION: Do not bend spring (46) to give too much take up or the tape will start to go into fast forward before the pressure roller reaches the capstan.

Take Up Reel Seat (2) And Feed Reel Seat (7) Drag Adjustment-

When the play-record control (74) is released, the reels should stop right away to prevent looping of the tape. Also when in fast forward or rewind and the control is released the reels should coast to a stop without looping the tape. The stop arms on the motorboard (point "B" on exploded view) that the take up and feed reel arms (43 and 51) rest against when the tape is not moving are what govern this. The stop arms should be bent to force the take up reel arm (43) and the feed reel arm (51) over far enough to take up enough belt tension so that the spindles just start to revolve without the reels in place. The play-record control (4) should be in its extreme counterclockwise position when making this adjustment. With the reels in place the spindles should not

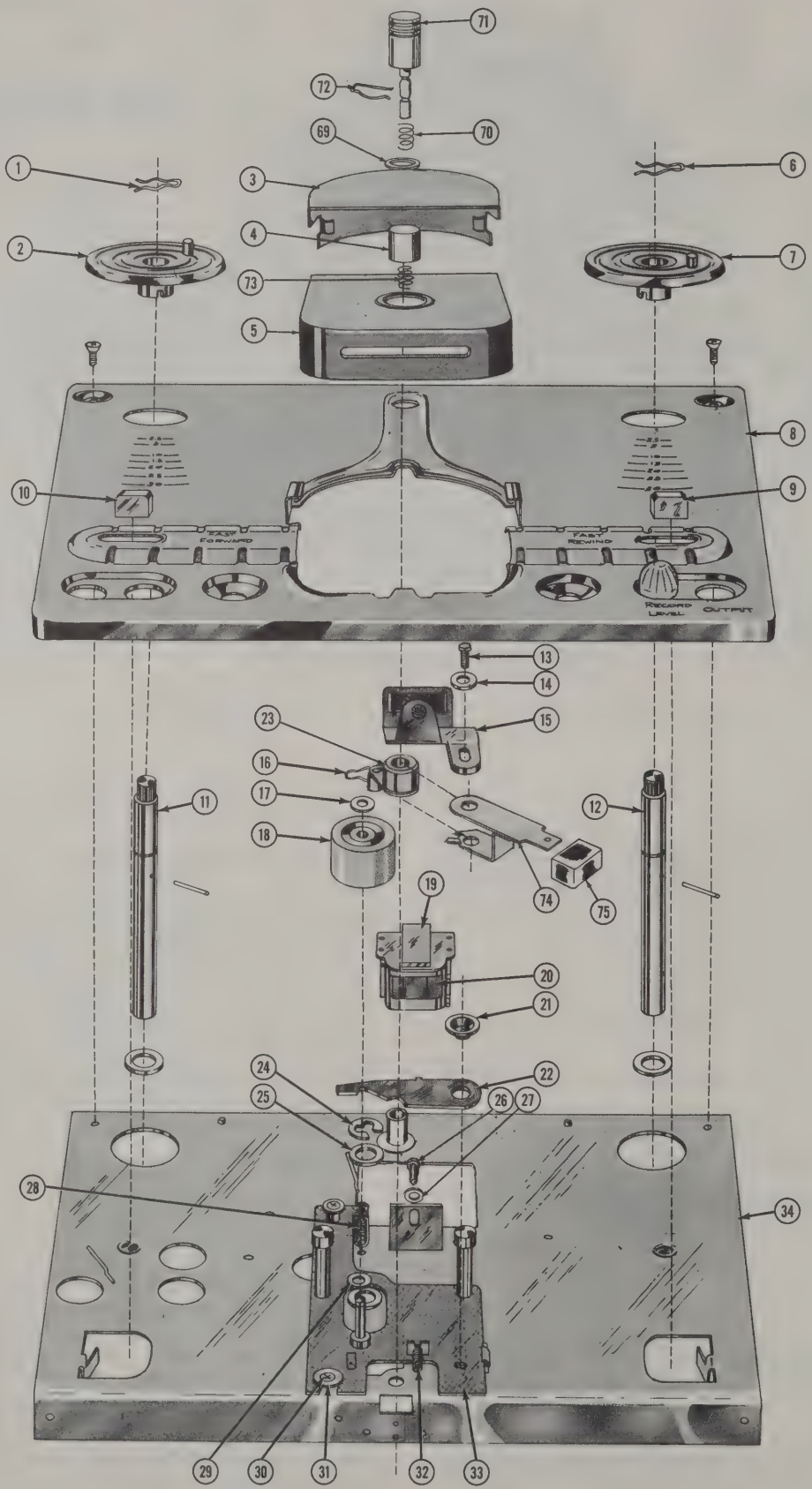

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Figure 6A. Exploded View of Parts Above Baseplate.

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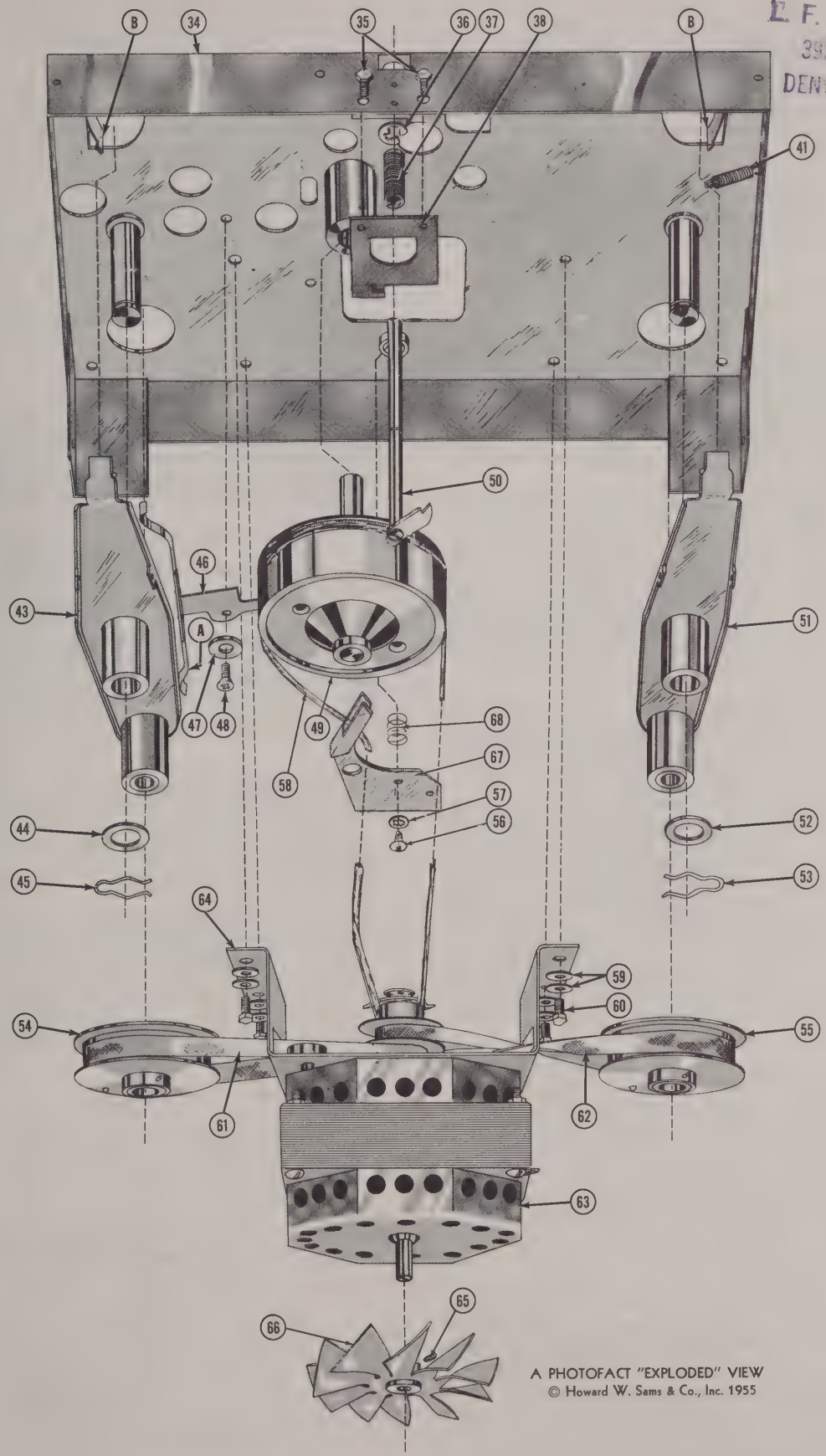

Figure 6B. Exploded View of Parts Below Baseplate.

revolve. If one or the other does, force the stop arm (point "B" on exploded view) over until it stops revolving.

Lifter Arm (23) Adjustment-

This adjusts the distance that the contact strip on the play-record switch will move when going into the record position. If an adjustment is necessary, place the unit in "Record" position. Loosen the set screw in the lifter arm (23) and rotate control shaft (50) to the left or right to center the contact strip with the contacts on the left end of the play-record switch. Make sure lifter arm (23) is down as far as it will go and tighten in position.

Play-Record-Erase Head Adjustment-

It is very important that the head be lined up perfectly with the tape. If it is not, low output, loss of high frequencies or track overlap may result. If the head is to be replaced, the complete assembly of the head and the bracket (19) that it mounts in should be changed. The bracket is adjusted to the head and sealed in place at the factory. There are two adjustments to be made which are as follows:

1. One is the head height. This is set by placing a .179" gauge (between 11/64" and 3/16") on the motorboard (34) under where the head is mounted. The head is pushed down flush with this gauge and tightened in place and the gauge removed. If a gauge is not obtainable set the head height while the unit is pulling tape. Move the head slowly up until the top edge of the tape is hitting the edge of the tape guides on the motorboard.

2. The second adjustment is for output and frequency response. To set this make a recording of a 3000 cycle signal on a good unit. Place this on the unit that the head is to be aligned on. Connect an output meter or AC voltmeter across the speaker voice coil. Play the 3000 cycle tape, rock the head holder (19) back and forth, screw (26) holding the holder on to the motorboard bracket will allow you to do this, and notice the variation in the output voltage at the voice coil. Tighten the head holder in the position of highest output. Make sure the head was not moved up or down while rocking it. If a 3000 cycle signal tape cannot be made, record a record with some high notes on it on another unit. Play this back on the unit to be adjusted and rock the head to give best high note response.

After setting the height and output check unit for track overlap. To do this take a reel of tape that has no recording on it. Make a recording on the unit that the head has been adjusted on. Do not rewind but take the reels off, reverse them and play the other track. There should be no sound heard. If what was recorded is heard backwards then there is track overlap. If this is the case, the guide on the head holder should be bent up to move the tracks further apart.

Pressure Pad Adjustment-

This applies the correct pressure between the tape and the head. To adjust this, loosen screw (13) that holds pressure pad bracket (15). Place unit in either "Play" or "Record" position. Move bracket (15) forward until the pressure pad moves back against its spring 1/16 ". Make sure the front edge of the bracket is parallel with the head and tighten screw (13).

NOTE: When ordering a replacement head, be sure to get the complete assembly of head, plug and bracket. The bracket is adjusted to the individual head and sealed at the factory. Also, when ordering a replacement motor, be sure to get the complete assembly of motor, pulley and plug. The pulley is turned down on the individual motor and is not interchangeable.

Hum Balance Adjustment-

If tube V1 or V2 is replaced or the head changed the setting of the hum balance pot (R3) should be checked. To do this, connect an external speaker to the unit as described under "To Use An External Speaker". Connect an AC voltmeter with a .1 volt AC scale across the speaker voice coil. Turn the "Volume" and "Tone" controls clockwise. Place the play-record control (74) in "Play" position. Put the AC meter on the .1 volt scale and adjust the hum pot. (R3), which is located between tubes V1 and V2 on top of the chassis, to its minimum reading. It should not exceed .1 volt. This is the only adjustment required in the amplifier.

LUBRICATION

The lubricants applied at time of manufacture should be sufficient for a long period of time. Approximately once a year, or in the event that parts are replaced, lubricate the unit as follows:

With No. 20 Motor Oil-

1. Take up reel arm (43) bushing.
2. Feed reel arm (51) bushing.
3. Spindle (11 and 12) bearings.
4. Flywheel (49) bearings.
5. Pressure roller (18) bearing.

With Staput No. 312 grease or lubriplate-

1. Pressure plate (33) at the slide buttons and the guide on the right side.
2. On the stud of the lifter arm (23).

CAUTION: Do not oil the motor bearings unless absolutely necessary as excess oil will only be thrown off and cause slipping of the pulleys and rollers. Always use as little oil as possible. If oil should get on the pulleys and rollers wipe off with a petroleum solvent, such as alcohol. Do not use carbon tetrachloride.

TROUBLES

Won't Take Up Tape Properly-

1. Spindle (11) binding.
   (a) Lubricate.
2. Improper take up spring (46) adjustment.
   (a) See "Take Up Spring Adjustment".
3. Belt (61) slipping.
   (a) Clean motor pulley and pulley (54).
4. Belt (61) broken.
   (a) Remove bracket (64) and replace belt.
5. Set screw loose in pulley (54).
   (a) Tighten and leave 1/32" to 1/16" end play in spindle.
6. Pulley (54) broken.
   (a) Replace pulley.

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Fast Forward Won't Function Properly-

1. See above except for step 2.

Fast Rewind Won't Function Properly-

1. Spindle (11 or 12) binding.
   (a) Lubricate.
2. Belt (62) slipping.
   (a) Clean motor pulley and pulley (55).
3. Belt (62) broken.
   (a) Remove bracket (64) and replace belt.
4. Set screw loose in pulley (55).
   (a) Tighten and leave 1/32" to 1/16" end play in spindle.
5. Pulley (55) broken.
   (a) Replace pulley.

Speed Variation or Wow-

1. Slippage.
   (a) Clean motor pulley, flywheel and capstan (49) and pressure roller (18) with a petroleum solvent, not carbon tetrachloride. Replace rubber rollers if they appear oil soaked.
2. Too much feed reel drag.
   (a) Check adjustment as described under "Take Up Reel Seat And Feed Reel Seat Drag Adjustment".
3. Flat spot on rubber roller (18).
   (a) A rapid thumping sound while the unit is running may indicate a flat spot on the rubber tire. If this condition does not clear up after several minutes of running time, replace the roller.

   (b) If the surface of the rubber roller is not smooth and even, replace the part.

   (c) Should the bearings of the rollers show signs of excessive wear or be extremely wobbly, the rollers should be replaced.
4. Tight feed or take up spindle (11 or 12)
   (a) Check adjustment as described under "Spindle End Play Adjustment".

   (b) Lubricate.
5. Tight pressure roller (18).
   (a) Lubricate.
6. Tight flywheel shaft (49).
   (a) Lubricate.
7. Pressure pad assembly (15) applying too much pressure against tape.
   (a) Check adjustment as described under "Pressure Pad Adjustment".

Stalling or Binding-

1. Speed control setting changed while unit not turned on. This should be done only when motor is running.

   (a) With motor turned "On", try moving speed control up and down several times.

Should the above fail, try holding the fast forward control (10) to the left as far as it will go and with the other hand manually rotate take-up reel spindle (6). If binding still continues it will be necessary to remove unit from case and free any binding action.

Speed Does Not Agree With Speed Setting-

1. Broken "ears" on motor drive pulley.

   (a) Replace entire motor.

Tape Creeps Out Of Tape Slot-

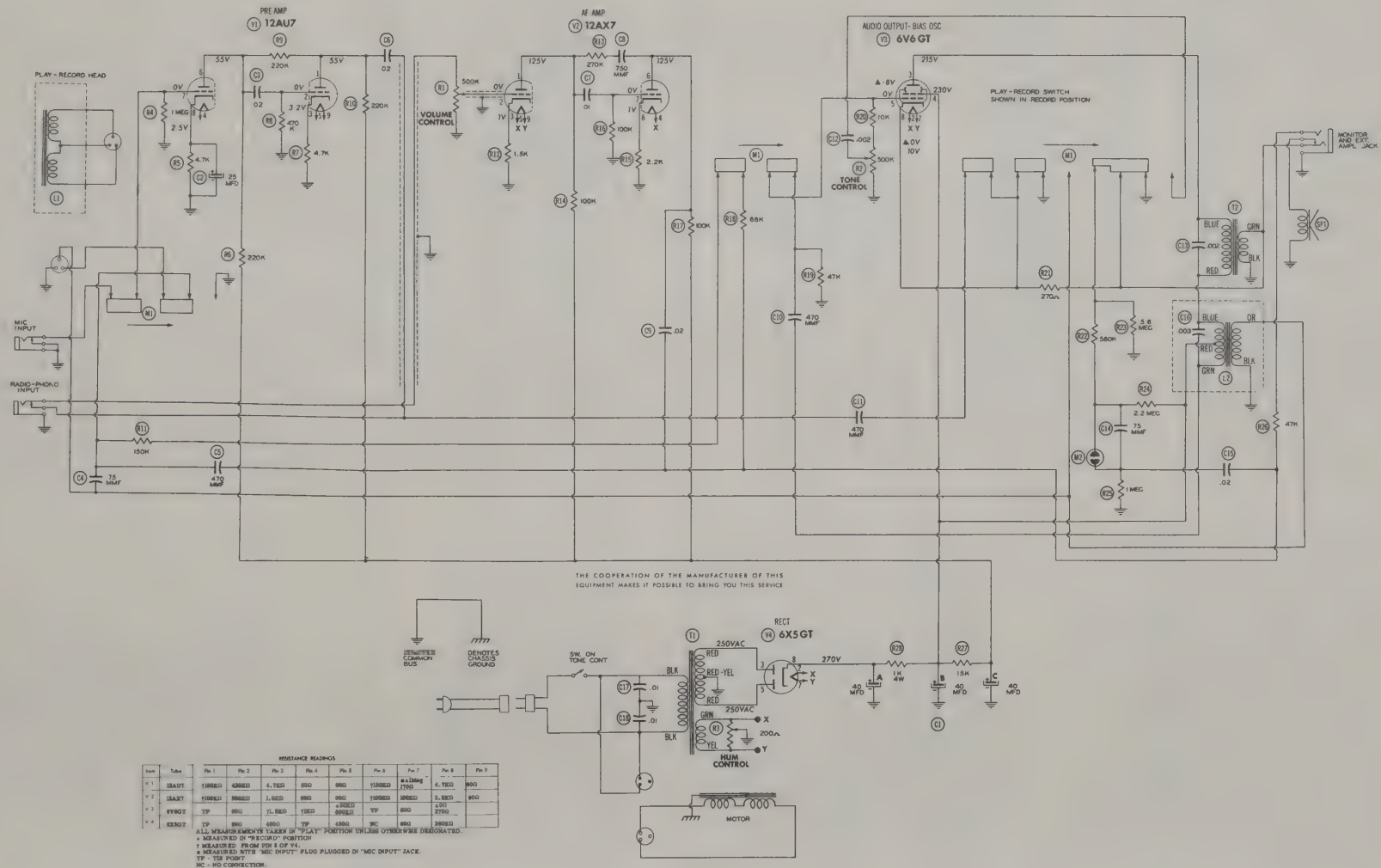
1. Head (20) improperly adjusted.

   (a) See "Play -Record -Erase Head Adjustment".

CLEANING

The record-playback head (20), capstan shaft and pressure roller (18) are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. This can cause distortion, weak output and poor erasure. Use a soft cloth and alcohol to clean the head surfaces, capstan and pressure roller.

CAUTION: Do not use a brush or any metallic object when cleaning the record-playback head as this could possibly mar the head surface.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7	†100KΩ	430KΩ	4.7KΩ	0Ω	0Ω	†100KΩ	4.7KΩ	4.7KΩ	0Ω
V2	12AX7	†100KΩ	300KΩ	1.0MΩ	0Ω	0Ω	†100KΩ	1MΩ	2.2KΩ	0Ω
V3	6V6GT	TP	0Ω	1.5KΩ	1KΩ	∞ 50KΩ 60KΩ	TP	0Ω	∞ 50Ω 270Ω	
V4	6X5GT	TP	0Ω	0Ω	TP	430Ω	NC	0Ω	260KΩ	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "RECORD" POSITION
† MEASURED FROM PIN 8 OF V4.
# MEASURED WITH "MIC INPUT" PLUG PLUGGED IN "MIC INPUT" JACK.
TP - TIE POINT
NC - NO CONNECTION.

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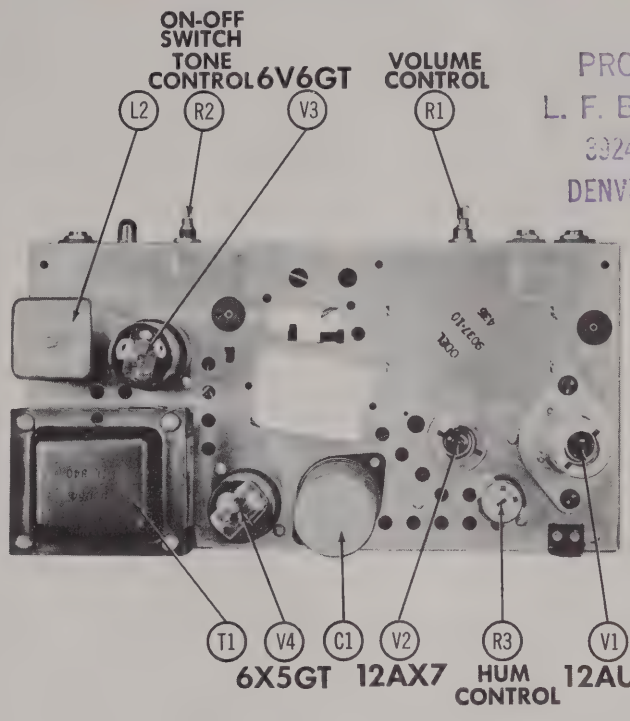

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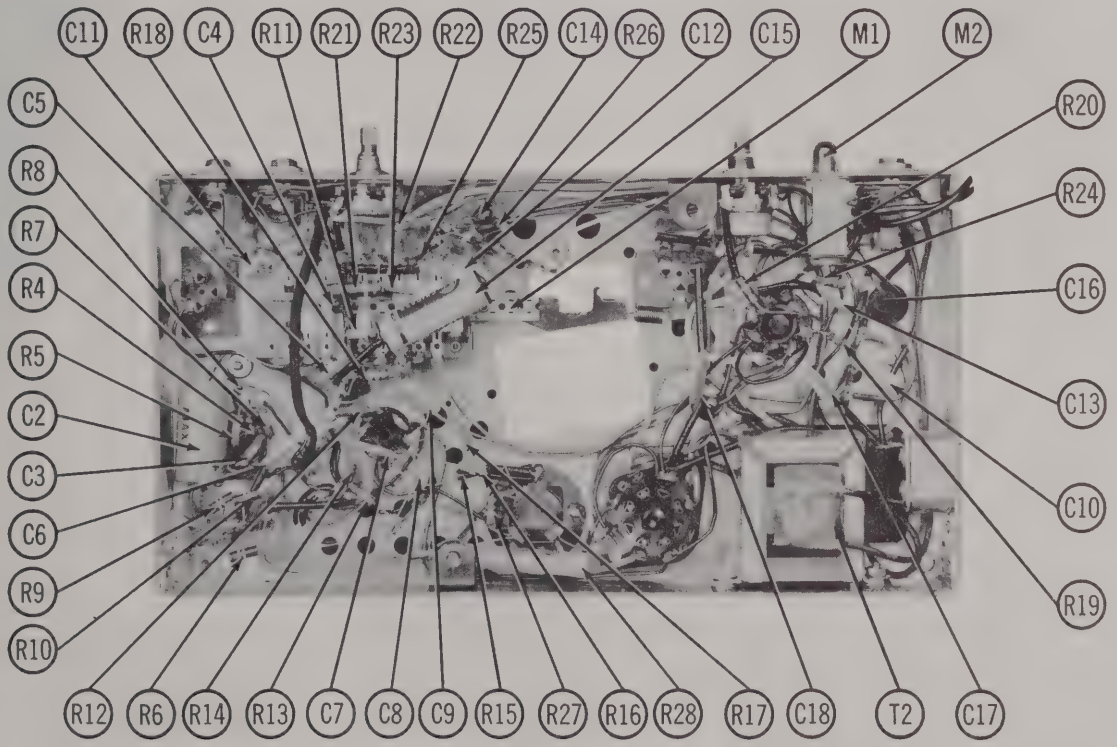

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	12AU7	Pre Amp	C1C		Elect. Cap. 40MFD @ 300V.
V2	12AX7	AF AMP	C2	770003	Elect. Cap. 25MFD @ 25V.
V3	6V6GT	Audio Output-Bias Osc.	C3	770095	Cap. Ceramic 20000MMF @ 500V.
V4	6X5GT	Rectifier	C4	770097	Cap. Ceramic 75MMF @ 500V.
C1A	770088	Elect. Cap. 40MFD @ 300V.	C5	770090	Cap. Ceramic 470MMF @ 400V.
C1B		Elect. Cap. 40MFD @ 300V.	C6	770095	Cap. Ceramic 20000MMF @ 500V.

ELECTRICAL PARTS LIST-Con't

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
C7	770096	Cap. Ceramic 10000MMF@500V.	R12	760003	Resistor 1.5K@1/2 W.
C8	770094	Cap. Ceramic 750MMF@500V.	R13	760052	Resistor 270K@1/2 W.
C9	770095	Cap. Ceramic 20000MMF@500V.	R14	760010	Resistor 100K@1/2 W.
C10	770090	Cap. Ceramic 470MMF@400V.	R15	760047	Resistor 2.2K@1/2 W.
C11	770090	Cap.Ceramic 470MMF@400V.	R16	760010	Resistor 100K@1/2 W.
C12	770110	Cap. Ceramic 2000MMF@1000V.	R17	760010	Resistor 100K@1/2 W.
C13	770110	Cap. Ceramic 2000MMF@1000V.	R18	760062	Resistor 68K@1/2 W.
C14	770094	Cap. Ceramic 75MMF@400V.	R19	760013	Resistor 47K@1/2 W.
C15	770095	Cap. Moulded Paper 20000MMF@ 500V.	R20	760019	Resistor 10K@1/2 W.
			R21	760115	Resistor 270Ω@1 W.
C16	700056	Cap. Ceramic 3000MMF@500V.	R22	760039	Resistor 560K@1/2 W.
C17	770071	Cap. Ceramic 10000MMF@400V.	R23	760054	Resistor 5.6Meg@1/2 W.
C18	770071	Cap. Ceramic 10000MMF@400V.	R24	760040	Resistor 2.2Meg@1/2 W.
R1	740051	Volume Control 500K@1/2 W.	R25	760001	Resistor 1 Meg@1/2 W.
R2	740052	Tone Control & Switch 500K@1/2 W.	R26	760013	Resistor 47K@1/2 W.
R3	740054	Hum Control 200Ω@1 W.	R27	760027	Resistor 15K@1/2 W.
R4	760001	Resistor 1 Meg. @1/2 W.	R28	760304	Resistor 1 K@4W.
R5	760017	Resistor 4.7K@1/2 W.	T1	700054	Transformer Power
R6	760036	Resistor 220K@1/2 W.	T2	700055	Transformer Output
R7	760017	Resistor 4.7K@ 1/2 W.	L1	011311	Record Head Assy.
R8	760037	Resistor 470K@1/2 W.	L2	700056	Coil Osc.
R9	760036	Resistor 220K@1/2 W.	M1	011301	Slide Switch Assy.
R10	760036	Resistor 220K@1/2 W.	M2	730006	Record Level Ind. NE51 Neon
R11	760064	Resistor 150K@1/2 W.	SP1	011298	Speaker PM 5 1/4"

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	460112	Hairpin Clip	34	011690	Baseplate; Includes staked and riveted parts
2	310204	Reel Plate (Red)			
3	100780	Head Cover	35	600111	Hex. Hd. M. S., #6-32x1/4
4	220027	Recording Button	36	460117	Control Shaft Retainer
5	100781	Cover	37	420109	Record Release Spring
6	460112	Hairpin Clip	38	100660	Control Shaft Bracket
7	310204	Reel Plate (Red)	41	420107	Spindle Arm Spring
8	450070	Top Plate	43	011329	Take-up Arm Assembly
9	310205	Rewind Control Knob (Red)	44	580156	Steel Washer
10	310205	Fast Forward Control Knob (Red)	45	460110	Hairpin Clip
11	011319	Spindle (Includes Roll Pin)	46	011328	Take-up Lever & Spring Assembly
12	011319	Spindle (Includes Roll Pin)	47	200288	Slide Button
13	600180	Screw, #6-32x5/16 Hex. Hd.	48	600243	Phillips Flat Hd. M. S., 6-32x1/4
14		Flat Washer, .142x5/16x1/32	49	011694	Flywheel & Capstan Shaft Assembly
15	011315	Pressure Bracket	50	011308	Control Shaft & Lever Assembly
16	460111	Hairpin Clip	51	011330	Rewind Arm
17	580143	Cloth Washer	52	580156	Steel Washer
18	011236	Pressure Roller	53	460110	Hairpin Clip
19	100556	Head Holder	54	011317	Pulley & Set Screw Assembly
20	011311	Play-Record-Erase Head, Head Holder, Cable and Plug Assembly	55	011317	Pulley & Set Screw Assembly
			56		Screw
21	200288	Slide Button Spacer Washer	57		Lockwasher
22	100658	Tension Arm	58	490087	Rubber Belt
23	011722	Lifter Arm & Set Screw Assembly	59	580056	Flat Washer
24	460018	Flywheel Retainer	60	600137	Hex. Hd. M. S., 8-32x1/4
25	580141	Flat Washer	61	490053	Take-up Drive Belt
26	600113	Screw, 8-32x5/16 Hex. Hd.	62	490053	Rewind Drive Belt
27	580056	Flat Washer	63	011692	Motor, Pulley, Cable and Plug
28	420105	Pressure Plate Return Spring	64	100654	Motor Mounting Bracket
29	580143	Cloth Washer	65	600153	"Allen" Set Screw, 8-32x3/16
30	600243	Phillips Flat Hd. M. S., 6-32x1/4	66	011321	Motor Fan; Includes Set Screw
31	200288	Slide Button	67	100760	Speed Control Bracket
32	420110	Tension Arm Spring	68	420151	Speed Control Spring (Lower)
33	011821	Pressure Plate; Includes Pressure Roller Stud, Bearing Spring and Tape Guide Studs	69	320054	Rubber Washer
			70	420151	Speed Control Spring (Upper)
			71	011693	Speed Control Knob
			72	420152	Speed Control Shaft Retainer
	011314	Pressure Plate; Includes Pressure Roller Stud, Bearing Spring, but does not include Tape Guide Studs	73	420155	Recording Button Spring
			74	011720	Control Lever
			75	310205	Control Lever Knob

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MODEL 21T-9630A

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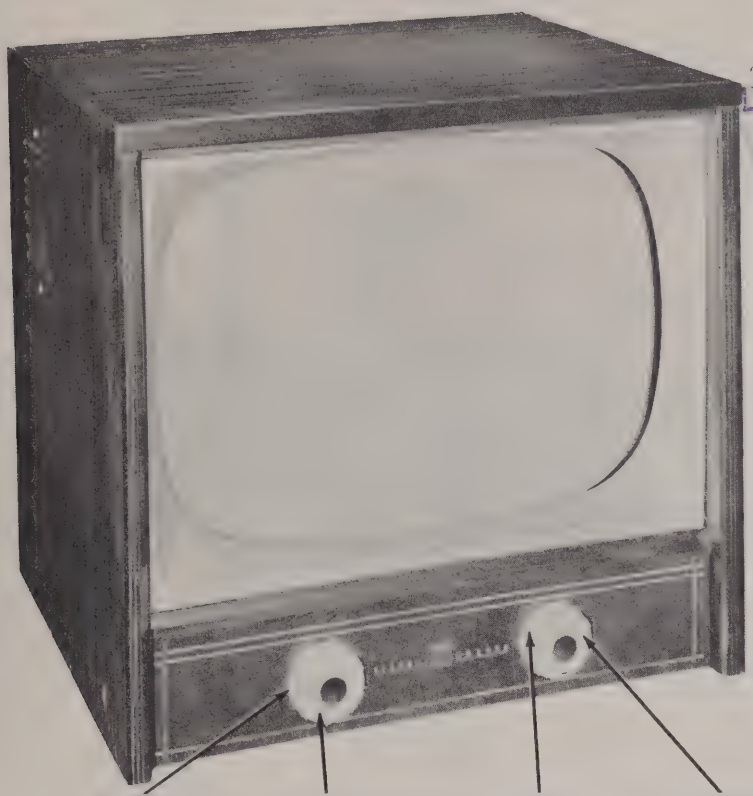

STEWART-WARNER MODEL 21T-9630A

TRADE NAME	Stewart-Warner Models 17T-9620A, 17T-9620B, 21C-9630C, 21C-9630CB, 21C-9630D, 21T-9630A, 21T-9630AB
MANUFACTURER	Stewart-Warner Electric, Division of Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago 15, Ill.
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.32 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.4MC, Sound IF 21.9MC (Intercarrier)

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STEWART-WARNER MODELS 17T-9620A, B, 21C-9630C, CB, D, 21T-9630A, AB

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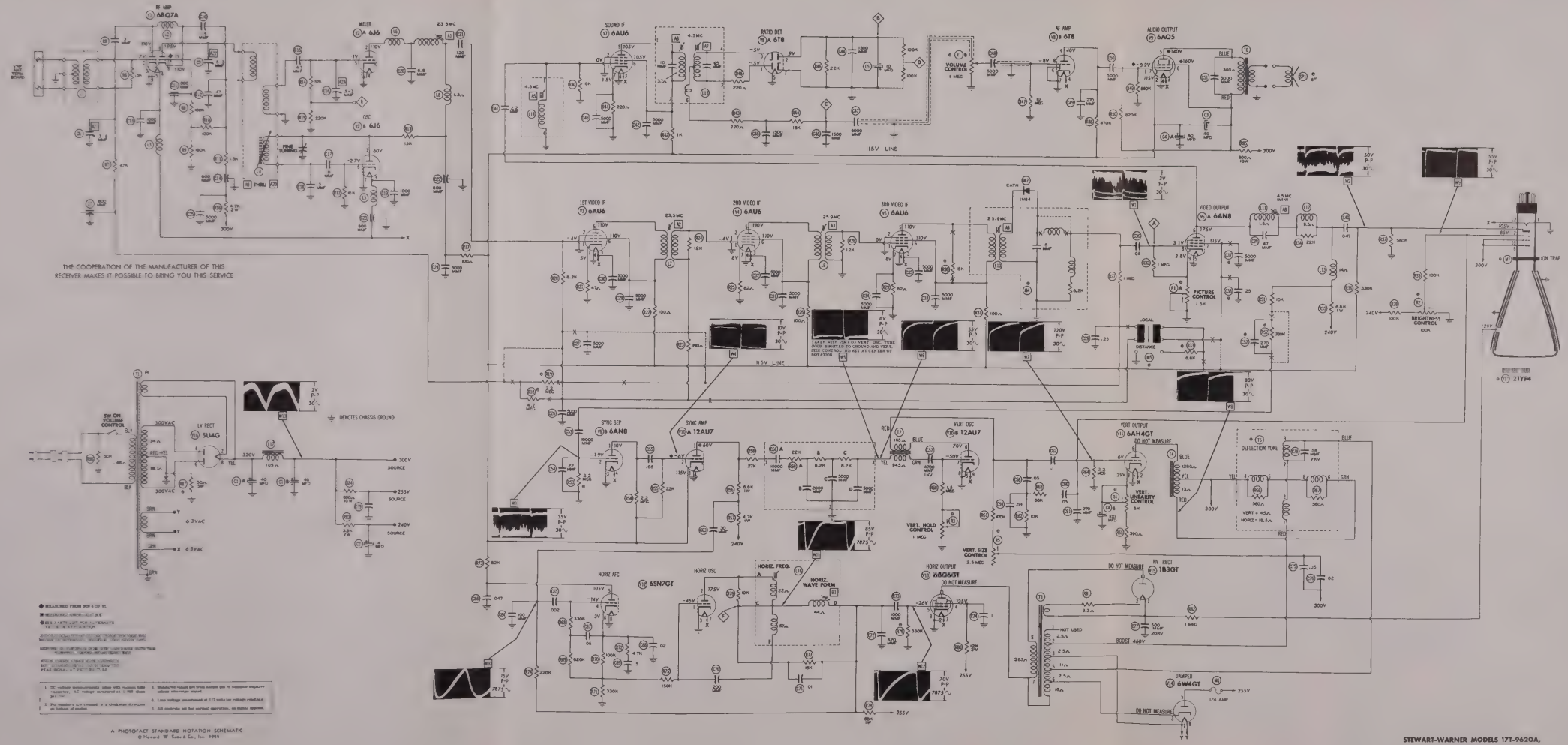
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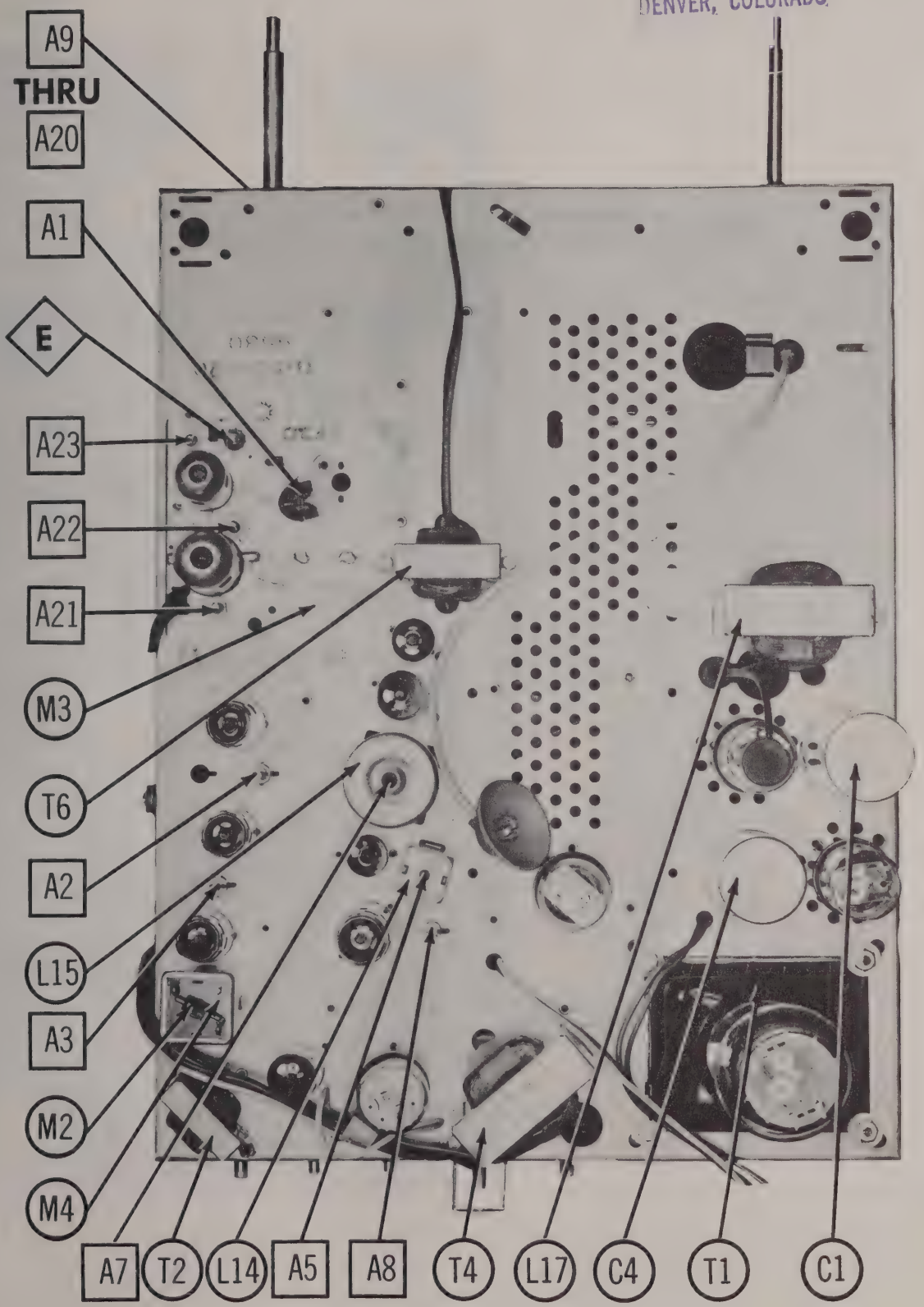

CHASSIS TOP VIEW

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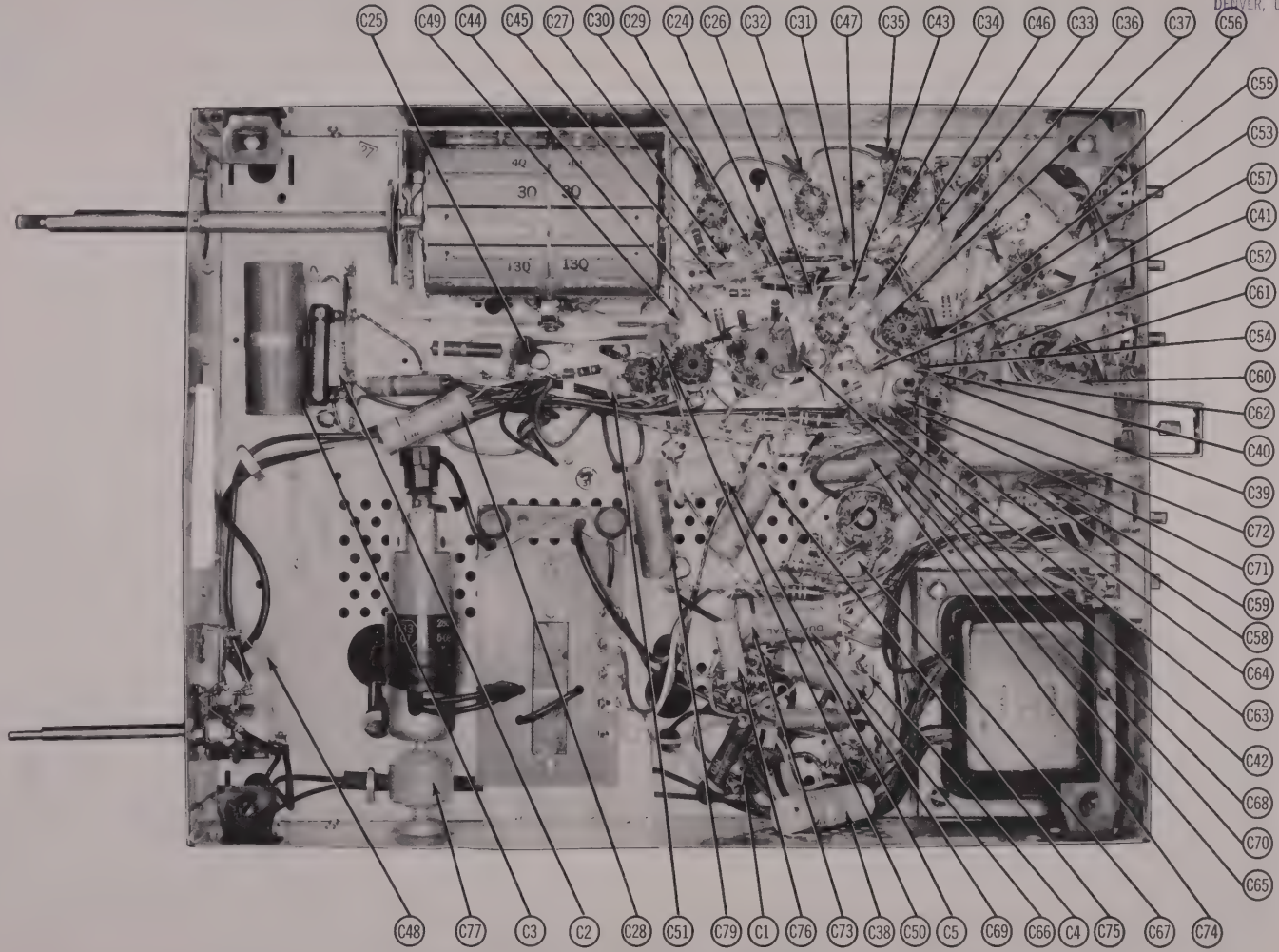
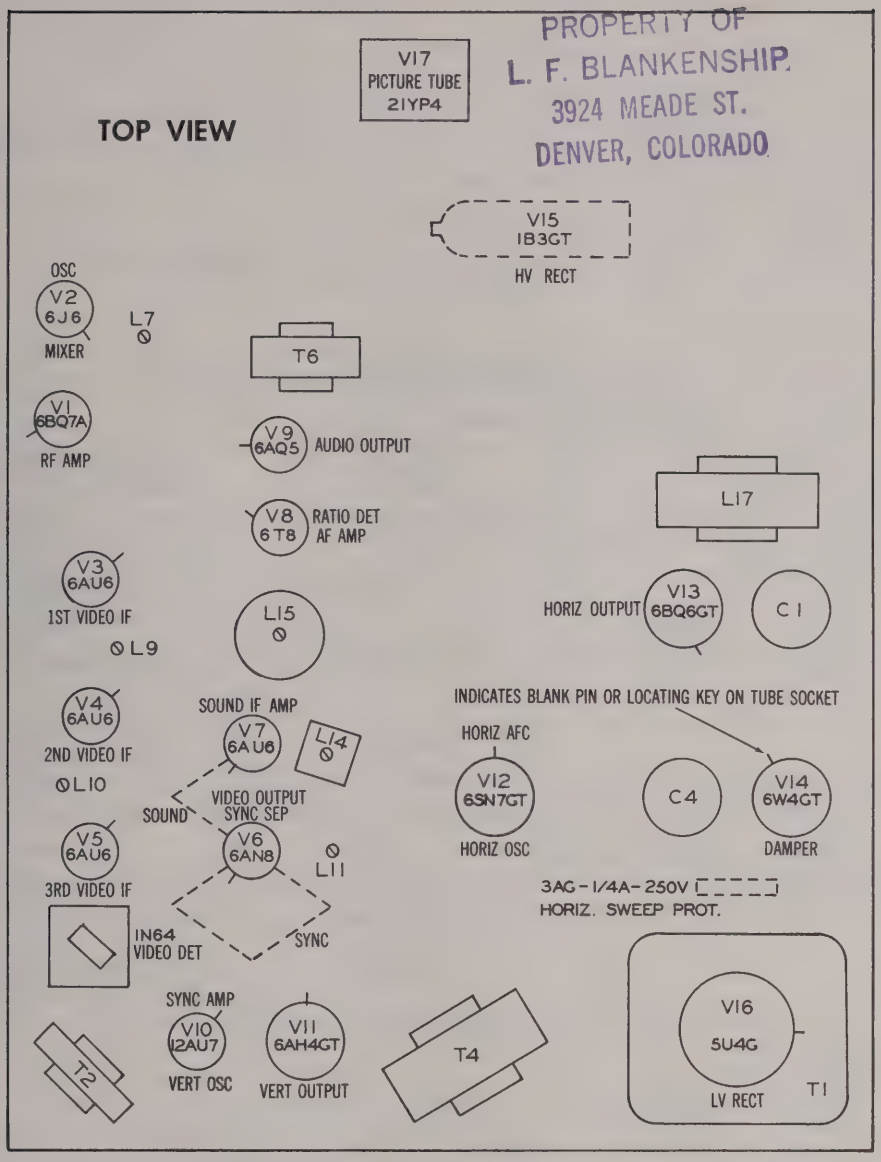


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V16

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V17
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V10
No horiz. sync - V10, V12
No vert. or horiz. sync - V6, V10

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V17
No vertical deflection - V10, V11
Poor vert. linearity or foldover - V10, V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, V16
Vert. off freq. - V10
Horiz. off freq. - V10, V12

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from chassis. Do not remove the horizontal oscillator tube (V12) to eliminate the high voltage shock hazard.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C28. Connect positive lead to chassis.
If the IF stages should break into oscillation during alignment, it will be indicated by excessive deflection on VTVM. Also, the voltage due to IF oscillation will be unaffected by signal strength from the generator. When IF oscillation is encountered, it may be eliminated by detuning the IF coils in different directions or increasing the bias from 3 volts to 4.5 volts. If the IF stages are aligned using a 4.5 bias, the IF channel should be stable with the bias reduced to 3 volts.
Use only enough generator output to produce a usable indication on scope or VTVM.
Set local-distance switch in local position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis	23.5MC (unmod)	Any	DC probe thru 10KΩ to point Ⓐ. Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	25.9MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis	24MC (10MC Swp)	21.9MC 22.6MC 26.4MC	Any	Vert. amp. thru 10KΩ to point Ⓐ. Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1 thru A4 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set contrast control to its fully counter clockwise position.
Short antenna terminals to chassis.
Connect two matched 100KΩ (±1%) resistors in series from point Ⓑ to B-. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (unmod)	Any	DC probe thru 10KΩ to point Ⓑ. Common to chassis.	A5, A6	Adjust for maximum deflection.
5.	"	"	"	"	DC probe thru 10KΩ to point Ⓒ. Common to point Ⓓ.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Short antenna terminals to chassis.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. thru 10KΩ to point Ⓑ. Low side to chassis.	A5, A6	Disconnect stabilizing capacitor C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
5.	"	"	"	"	"	Vert. amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A7	Reconnect stabilizing capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Remove 6AU6 (V4) from its socket.
Short antenna terminals to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (unmod)	Any	DC probe thru detector (Fig. 4) to pin 11 of picture tube.	A8	Adjust for MINIMUM deflection. Replace V4 in its socket.

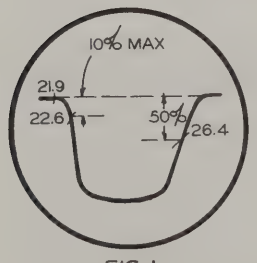


FIG. 1

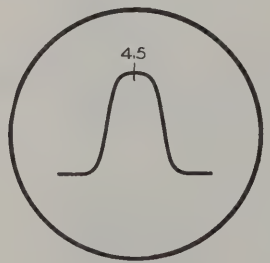


FIG. 2

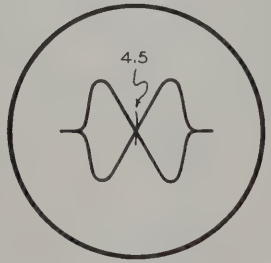


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustments are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel. Leave bias connected as under "Video IF Alignment".
Use only enough sweep generator output to provide usable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193. 25MC 197. 75MC	10	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A9	Adjust to place sound marker as shown in Fig. 5. Video marker should be at 50%.
			213MC (10MC Swp)	211. 25MC 215. 75MC	13		A10	
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A11	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A12	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A13	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A14	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A15	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A16	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A17	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A18	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A19	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A20	

RF AND MIXER ALIGNMENT

Leave bias connected as under "Video IF Alignment". Use only enough sweep generator output to provide usable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193. 25MC 197. 75MC	10	Vert. amp. thru 10KΩ to point (E). Low side to chassis.	A21, A22, A23	Adjust for response curve similar to Fig. 6.
9.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		Check for response curve similar to Fig. 6. If markers fall below 70% on any channel, make slight compromise adjustment of A21, A22 and A23 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12			
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

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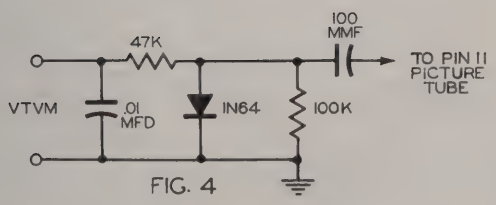


FIG. 4

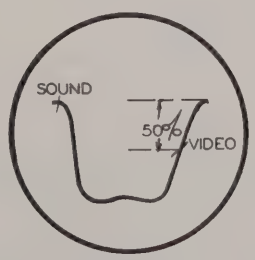


FIG. 5

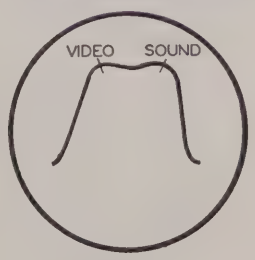
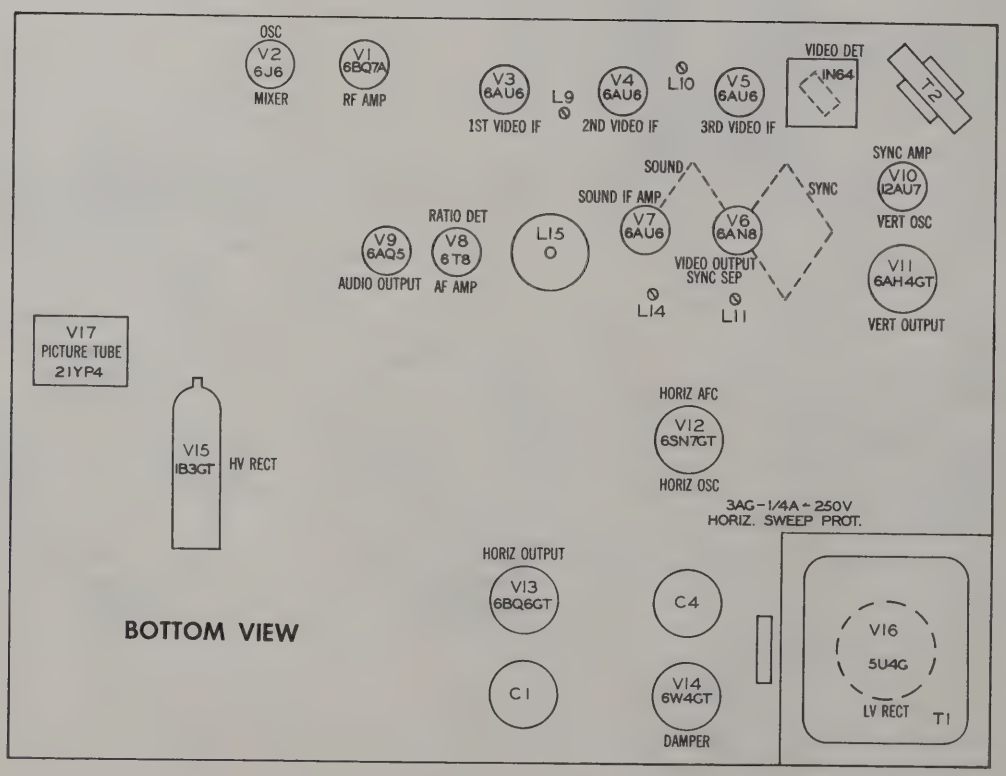


FIG. 6

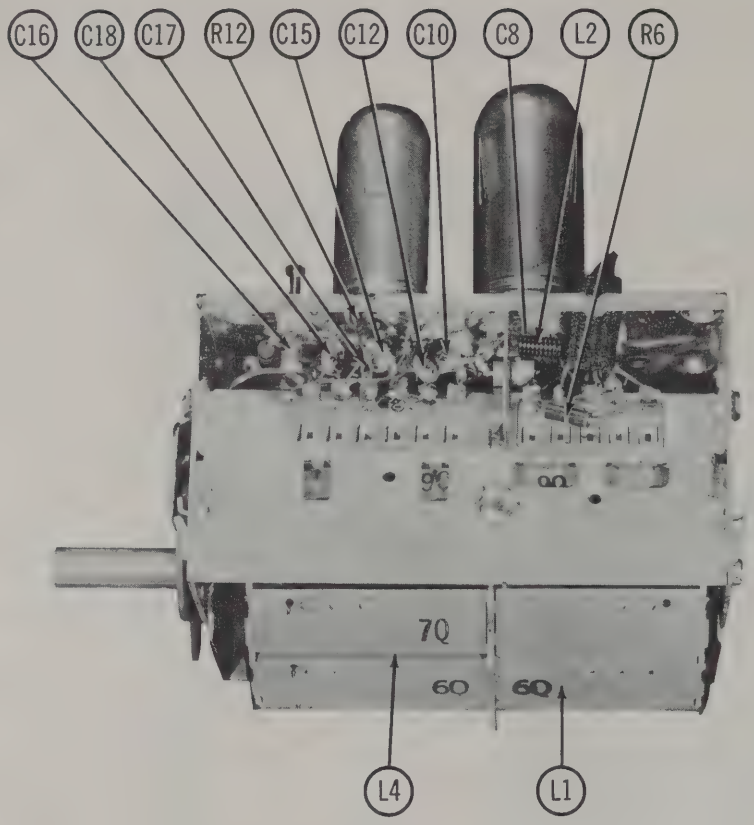
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	1. 8Meg	0Ω	. 1Ω	0Ω	†6. 3KΩ	200KΩ	INF	0Ω
V 2	6J6	■15KΩ	■100Ω	. 1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6AU6	1Meg	0Ω	. 1Ω	0Ω	■100Ω	■100Ω	47Ω		
V 4	6AU6	1Meg	0Ω	. 1Ω	0Ω	■100Ω	■100Ω	82Ω		
V 5	6AU6	. 4Ω	0Ω	. 1Ω	0Ω	■100Ω	■100Ω	82Ω		
V 6	6AN8	■2.2Meg	2. 2Meg	0Ω	. 1Ω	0Ω	†1KΩ	■0Ω	1Meg	300Ω
V 7	6AU6	. 9Ω	0Ω	. 1Ω	0Ω	■1KΩ	■1KΩ	220Ω		
V 8	6T8	INF	22KΩ	INF	. 1Ω	0Ω	0Ω	0Ω	10Meg	■470KΩ
V 9	6AQ5	350KΩ	250KΩ	. 1Ω	0Ω	†1. 1KΩ	†700Ω	350KΩ		
V 10	12AU7	†15KΩ	■22KΩ	250KΩ	0Ω	0Ω	▲1. 7Meg	2Meg	0Ω	. 1Ω
V 11	6AH4GT	2. 2Meg	. 1Ω	NC	TP	†1. 4KΩ	TP	0Ω	2KΩ	
V 12	6SN7GT	500KΩ	†68KΩ	0Ω	1. 5Meg	■82KΩ	430KΩ	. 1Ω	0Ω	
V 13	6BQ6GT	TP	0Ω	TP	†13KΩ	330KΩ	TP	. 1Ω	0Ω	Top Cap ▲16Ω
V 14	6W4GT	TP	TP	INF	NC	†700Ω	TP	INF	INF	
V 15	1B3GT	PINS 1 - 8 HAVE INFINITE RESISTANCE								Top Cap ▲400Ω
V 16	5U4G	INF	100KΩ	INF	34Ω	INF	37Ω	INF	100KΩ	
V 17	21YP4	0Ω	†200KΩ	Pin 6 †105Ω	Pin 10 †105Ω	Pin 11 ■250KΩ	Pin 12 . 1Ω			

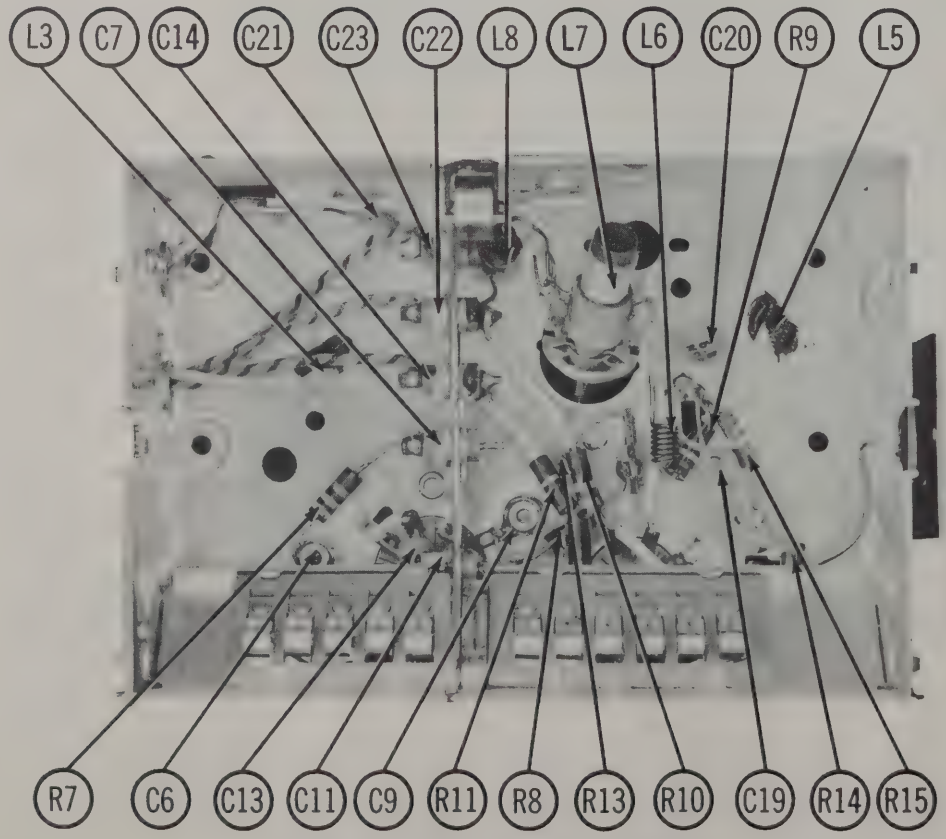
ALL MEASUREMENTS TAKEN WITH "LOCAL-DISTANCE" SWITCH IN "LOCAL" POSITION.
† MEASURED FROM PIN 8 OF V16.
■ MEASURED FROM 115V LINE.
▲ MEASURED FROM PIN 3 OF V14.
NC - NO CONNECTION
TP - TIE POINT



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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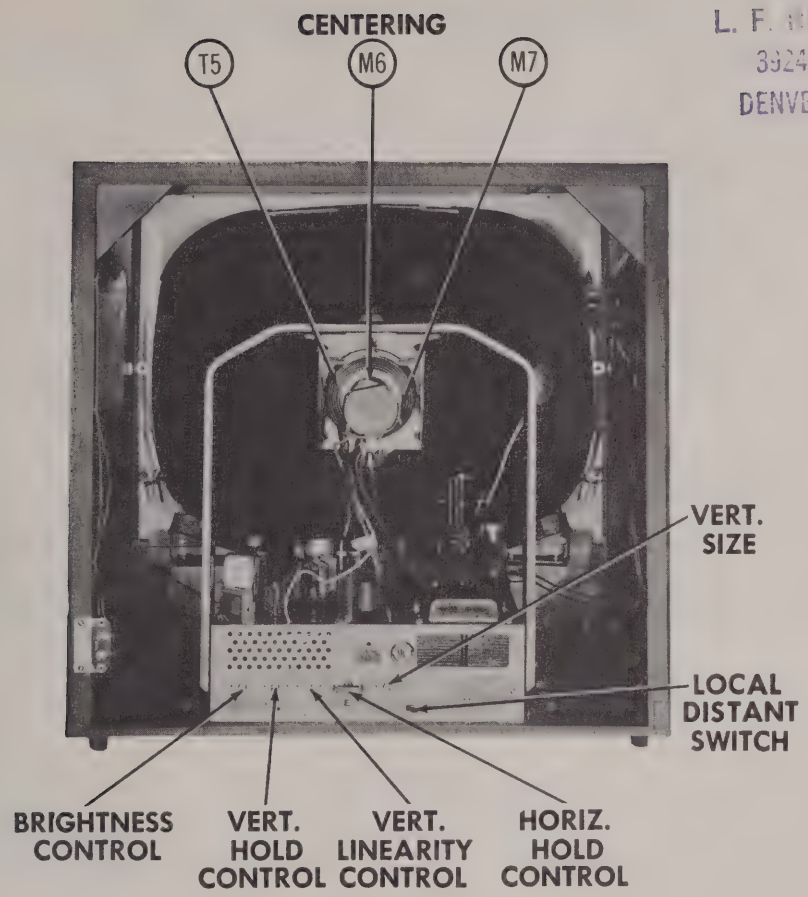
3924 McKEE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal frequency adjustment fully counter clockwise. Connect jumper across terminals "C" and "D" of horizontal oscillator transformer (L16).

Turn the horizontal frequency adjustment clockwise until picture locks in sync.

Remove jumper from "C" and "D" of L16.

Adjust the waveform slug (B1) until picture again locks in sync. If the picture cannot be made to sync properly after the above adjustments are made it will be necessary to perform the horizontal waveform adjustment.

HORIZONTAL WAVEFORM ADJUSTMENT

Connect a jumper across "C" and "D" of L16, and turn horizontal frequency adjustment until picture pulls into sync.

Remove jumper from across L16.

Connect the low capacity probe of oscilloscope to point (F) and chassis.

Turn the horizontal frequency adjustment clockwise until picture loses sync, then counter clockwise until picture just falls into sync.

Adjust B1 for broad and narrow peaks of equal height as in Fig. 7. If necessary keep the picture in sync while adjusting B1 by turning the horizontal frequency adjustment.

Remove the oscilloscope.

The picture should now remian in sync when switched off channel and back again.

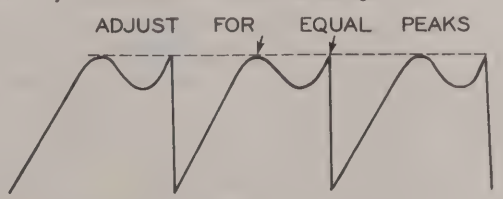


FIG. 7

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V13, V14 and V16. Check C72, C73, R80, T3, T5A and other associated components.

DRIVE LINES

Check by substitution V13 and V14. Check C72, C73, R80, T3, T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V13 and V14. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V12, V13 and V14. Check C68, C69, R72 for open. Check L16, C70, C65, C63 and other associated components.

XMAS TREE EFFECT

Check by substitution V12, V13 and V14. Check T3 and T5 for internal arcing. Check C64, R74, R76, R77, L16 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V10 and V11. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T4, T5B, C4B, R4, R65 and other associated components.	Check T2, C57, C62, R61, R60, R5 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V10 and V11. Check vertical size and vertical linearity controls for proper operation. Check R61, T4 and other associated components.

COMPRESSED AT BOTTOM

Check by substitution V10 and V11. Check T2, C62, R61, R5 and other associated components.

COMPRESSED AT TOP

Check by substitution V10 and V11. Check C4B, C62, R65, R4, T4 and other associated components.

FOLDS

Check by substitution V10 and V11. Check C58, C62, C59, T4, T5B and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V6 and V10. Check C53, C55, R54, R55, R56, R57 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V10. Check vertical integrator network. Check T2, C57, R60, R3 and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V12. Check C63, C65, C69, C70, R73, L16 and other associated components.

HORIZONTAL BENDING

Check by substitution V6, V10 and V12. Check components associated with V12.

VIDEO

LOSS OF VIDEO

Substitute V6. Check C36, C40, R35, L13, L12 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A8. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check C36, C40, C39, L12, R34 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check crystal detector network. Check C36, C40 and other associated components.

SMEAR

Substitute V6. Check crystal detector network. Check L12, C36, C40 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8 and V9. Check stages V9 and V10 using audio signal generator. Apply audio signal across R18.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C47, C48, C49, C50, C51, R48, R50, T6, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A7 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, substitute V16. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V16. Check B+ filter and decoupling network.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Stewart-Warner PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	Osc. Mixer	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Output-Sync Separator	6AN8	6AN8	9DA	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V9	Audio Output	6AQ5	6AQ5	7BZ	
V10	Sync Amp.-Vert. Osc.	12AU7	12AU7	9A	
V11	Vert. Output	6AH4GT	6AH4GT	8EL	
V12	Horiz. AFC-Horiz. Osc.	6SN7GT	6SN7GT	8BD	
V13	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V14	Damper	6W4GT	6W4GT	4CG	
V15	HV Rectifier	1B3GT	1B3GT	3C	
V16	LV Rectifier	5U4G	5U4G	5T	

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3614 GRANDE ST.
DENVER, COLORADO

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	Stewart-Warner PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V17	21YP4	21YP4	21YP4	21YP4	21YP4	12L	① Aluminized
	21YP4A ①	21YP4A ①	21YP4A ①	21YP4A②	21YP4A ①	12L	② Silver Screen
	17HP4/17RP4	17HP4/17RP4	17RP4/17HP4	17HP4/17RP4	17RP4	12L	
				17HP4B②		12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Stewart-Warner PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲40	450	521578			FP238	TM-D20-450	D-235	
B	▲40	450							
C2	4	450	504719			TC70	TD-4-450	MT-4504	
C3	40	300	160095			TC78	TD-40-350	FM-4540	
C4A	▲80	250	509002			FP382.1	TM-3057	D-322	
B	■100	50							
C5	10	150	505174			TC42	TD-10-150	MT-1512	
C6	3-9		509064	829-10					
C7	800								
C8	3		513453	TCZ-3	NP0A-030	ZT-5533			
C9	.5-3		507968	829-3	3115-01-0R5	CT565A			
C10	1.5		520720	TCZ-1R5	NP0A-1R5	ZT-5515			
C11	800								
C12	47		520719	DD-470	831-470	UC-5447			
C13	1000		520735	DD-102	801-001	DC-521			
C14	800								
C15	47		520719	DD-470	831-470	UC-5447			
C16	.5-3		507968	829-3	3115-01-0R5	CT565A			
C17	10		520718						
C18	5		520717						
C19	1000		520735	DD-102	801-001	DC-521			
C20	6.8		520716	TCZ-6R8	NP0A-6R8	ZT-5568			
C21	120		513029	DD-121	811-121	UC-5312			
C22	800								
C23	800								
C24	5000		513013	DD-502	811-005	DC-525		C-1250	
C25	5000		513013	DD-502	811-005	DC-525		C-1250	
C26	5000		513013	DD-502	811-005	DC-525		C-1250	
C27	5000		513013	DD-502	811-005	DC-525		C-1250	
C28	.25	200	512044			PT4025	IMP2-P25	3302025	
C29	5000		513013	DD-502	811-005	DC-525		C-1250	
C30	5000		513013	DD-502	811-005	DC-525		C-1250	
C31	5000		513013	DD-502	811-005	DC-525		C-1250	
C32	5000		513013	DD-502	811-005	DC-525		C-1250	
C33	5000		513013	DD-502	811-005	DC-525		C-1250	
C34	5000		513013	DD-502	811-005	DC-525		C-1250	
C35	5000		513013	DD-502	811-005	DC-525		C-1250	
C36	.05	200	512026	DF-503		PT415	IMP2-S5	330215	
C37	5000		513013	DD-502	811-005	DC-525		C-1250	Note 1
C38	.25	400				PT4025	IMP4-P25	3304025	Note 1
C39	47		513438						
C40	.047	400	512028	DF-503		PT4147	IMP4-S47	3304147	
C41	2.2		513001	TCZ-2R2	NP0A-2R2	ZT-5522			
C42	5000		513013	DD-502	811-005	DC-525		C-1250	
C43	5000		513013	DD-502	811-005	DC-525		C-1250	
C44	1500		513012	DD-152	801-0015	DC-5215		C-1215	
C45	1500		513012	DD-152	801-0015	DC-5215		C-1215	
C46	1500		513012	DD-152	801-0015	DC-5215		C-1215	
C47	5000		513013	DD-502	811-005	DC-525		C-1250	
C48	5000		513013	DD-502	811-005	DC-525		C-1250	
C49	270		513006	DD-271	811-271	UC-5327		K-1327	
C50	5000		513013	DD-502	811-005	DC-525	IMP6-D5	C-1250	
C51	5000		513013	DD-502	811-005	DC-525	IMP6-D5	C-1250	
C52	270		513006	D6-271	GP2K-271	UC-5327		K-1327	Note 1
C53	10000		513046	DD-103	811-01	DC-511	IMP6-S1	330611	
C54	22		513406						
C55	.05	200	512026	DF-503		PT415	IMP2-S5	330215	
C56A	10000					DC-511	IMP6-S1	330611	
B	2000		♦508062	†PC-100	†1405-01	DC-522	IMP6-D2	C-1220	
C	5000			DD-103	811-01	DC-525	IMP6-D5	C-1250	
D	5000					DC-525	IMP6-D5	C-1250	
C57	4700	1000	512533						
C58	.05	600	512030	DF-503		PT615	IMP6-S5	330615	
C59	.03	200	512020	DF-303		PT613	IMP6-S3	330613	

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DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA Stewart-Warner Part No.	CENTRALAB Part No.	ERIE Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.
C80	.05	200	512036	DF-503		PT415	IMPD-S5	330215
C81	270	500	513006	DD-271	81-271	UC-5327		K-1327
C82	.1	600	512008	DF-104		PT601	IMPD-P1	330601
C83	.02	500	512500	TCS-20	MPOL-309			KH-1430
C84	100	500	512502	TCS-100	MPO-337-101	MCE225		KH-1310
C85	.002	600	512002	DS-202	GPS-333-203	PT623	IMPS-DS	330623
C86	.047	400	512024	DF-503		PT414T	IMPD-447	3304147
C87	.05	200	512034	DF-503		PT413	IMPD-S5	330215
C88	.02	600	512016	DF-302	81Y-GS	PT623	IMPS-GS	330613
C89	.5	200	512050			PT405	IMPD-P5	330205
C90	200	500	512550	TCS-300	MPO-334-301	MCE227		KH-1330
C91	.01	500	512312	DS-103	GPJ-333-103	PT611	IMPS-S1	330611
C92	820	500	512547					KH-1303
C93	1000		513009	DD-102	811-DH	DC-521		K-1310
C94	.1	600	513018	DF-104		PT601	IMPD-P1	330601
C95	.05	600	512030	DF-503		PT615	IMPD-S5	330615
C96	.02	400	512018	DF-303	81Y-GS	PT623	IMPS-GS	330613
C97	5	20000	530990	TV3-502	41D	SVA5048A		
C98	56	2000	513027	DD30-562	31KV-562	DC30456		
C99	.1	600	512036	DF-104		PT601	IMPD-P1	330601

Note 1. Not used in some versions.
* Items C58A, C58B, C58C, C58D, R58A, R59B and R59C are combined in one unit.
† Connect 10000MMF capacitor in series with input lead of capacitor-resistor unit to replace original Mfgr. unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stewart-Warner Part No.	IRC Part No	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1500Ω	½	532744	*QJ-704	RTV-296	F1-7	UF152R	Picture - Panel - Note 1
B	1Meg	2				R2-53	UR16A	Volume - Rear
C	Switch					KB-1	UR-26	Attach to R1B
R2A	500Ω	½	532083	QJ1-128	A47-100K-S	BK-40	SU-41	Brightness - Note 2
B	Shaft		Not Req.	Not Req.	FK2-1/4	Not Req.	Not Req.	Attach to R2A
R3A	500Ω	½	532083	QJ1-128	A47-100K-S	SU-41	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FK2-1/4	AK-1	Not Req.	Attach to R3A
R3A	1Meg	½	532081	QJ1-137	A47-1Meg-S	BK-39	SU-54	Vert. Hold - Note 3
B	Shaft		Not Req.	Not Req.	FK2-1/4	AK-1	Not Req.	Attach to R3A
R4A	1Meg	½	532349	QJ1-137	A47-1Meg-S	AB-59	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	FK2-1/4	AK-1	Not Req.	Attach to R3A
R4A	5000Ω	½	532080	QJ1-14	A47-5000-S	BK-10	SU-14	Vert. Linearity - Note 4
B	Shaft		Not Req.	Not Req.	FK2-1/4	Not Req.	Not Req.	Attach to R4A
R4A	5000Ω	½	530945	QJ1-14	A47-5000-S	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK2-1/4	AK-1	Not Req.	Attach to R4A
R5A	2.5Meg	½	532083	QJ1-139	A47-2.5Meg-S	BK-53	SU-565	Vert. Size - Note 5
B	Shaft		Not Req.	Not Req.	FK2-1/4	Not Req.	Not Req.	Attach to R5A
R5A	2.5Meg	½	530964	QJ1-139	A47-2.5Meg-S	AB-53	SU-565	Vert. Size
B	Shaft		Not Req.	Not Req.	FK2-1/4	AK-1	Not Req.	Attach to R5A

Note 1. Chassis bearing serial numbers above 106, 701 will use an alternate control part no. 523515.
Note 2: Some versions will use an alternate control part no. 530852.
Note 3. Some versions will use an alternate control part no. 522549.
Note 4: Some versions will use an alternate control part no. 530943.
Note 5: Some versions will use an alternate control part no. 530944.
* CONCENTRIKIT EQUIVALENT: KIT K-4, BASE ELEMENTS & SHAFTS: B17-109 & P1-234 (PANEL)
B13-137 & R1-313 (REAR)
76-1 SWITCH
† Universal replacement (Mallory exact duplicate part no. U31S8S)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Stewart-Warner Part No.	IRC Part No.	NOTES
R6	15KΩ	½	510157	BTS-15K	
R7	47KΩ	½	510167	BTS-47K	
R8	100KΩ	½	510172	BTS-100K	
R9	180KΩ 5%	½	510774	BTS-180K 5%	
R10	100KΩ 5%	½	510751	BTS-100K 5%	
R11	1500Ω	½	510139	BTS-1500	
R12	10KΩ	½	510154	BTS-10K	
R13	15KΩ	½	510157	BTS-15K	
R14	10KΩ	½	510154	BTS-10K	
R15	220KΩ	½	510179	BTS-220K	
R16	4700Ω	2	510348	BTB-4700	
R17	100Ω	½	510118	BTS-100	
R18	4.7Meg	½		BTS-4.7Meg	Note 1
R19	2.2Meg	½		BTS-2.2Meg	Note 1
R20	8200Ω	½	510153	BTS-8200	
R21	470	½	510112	BTS-47	
R22	100Ω	½	510118	BTS-100	
R23	390Ω	½	510129	BTS-390	
R24	12KΩ 5%	½	510156	BTS-12K 5%	
R25	82Ω	½	510117	BTS-82	
R26	100Ω	½	510118	BTS-100	
R27	1Meg	½	510190	BTS-1Meg	
R28	12KΩ 5%	½	510156	BTS-12K 5%	
R29	82Ω	½	510117	BTS-82	
R30	15KΩ	½	510157	BTS-15K	Note 1
R31	100Ω	½	510118	BTS-100	
R32	1Meg	½	510190	BTS-1Meg	
R33	680Ω	½		BTS-680Ω	Note 1
R34	22KΩ	½	510160	BTS-22K	
R35	680Ω	½	510251	BTA-680Ω	
R36	330KΩ	½	510181	BTS-330K	
R37	560KΩ	½	510182	BTS-560K	
R38	100KΩ	½	510172	BTS-100K	
R39	100KΩ	½	510172	BTS-100K	
R40	1MΩ	½	510159	BTS-1M	
R41	120Ω	½	510124	BTS-120	
R43	220Ω	½	510124	BTS-220	
R44	18KΩ	½	510159	BTS-18K	
R45	220Ω	½	510124	BTS-220	
R46	22KΩ	½	510160	BTS-22K	
R47	10Meg	½	510187	BTS-10Meg	
R48	470KΩ	½	510184	BTS-470K	
R49	560KΩ 5%	½	510778	BTS-560K 5%	
R50	820KΩ 5%	½	510747	BTS-820K 5%	
R51	10KΩ	½	510154	BTS-10K	
R52	330KΩ	½		BTS-330K	Note 1
R53	2.2Meg	½		BTS-2.2Meg	Note 2
R54	2.2Meg	½	510193	BTS-2.2Meg	
R55	22KΩ	½	510160	BTS-22K	
R56	6800Ω	½	510251	BTA-6800	
R57	4700Ω	½	510248	BTA-4700	
R58	27KΩ	½	510162	BTS-27K	
R59A	22KΩ	½		BTS-22K	
B	8200Ω	½		*508063	BTS-8200
C	8200Ω	½			BTS-8200
R60	1.5Meg 5%	½	510787	BTS-1.5Meg 5%	
R61	470KΩ	½	510184	BTS-470K	
R62	10KΩ	½	510154	BTS-10K	
R63	68KΩ	½	510159	BTS-68K	
R64	2.2Meg	½	510193	BTS-2.2Meg	
R65	390Ω	½	510139	BTS-390	
R66	560Ω	½	510132	BTS-560	
R67	560Ω	½	510132	BTS-560	
R68	330KΩ	½	510181	BTS-330K	
R69	820KΩ	½	510189	BTS-820K	
R70	100KΩ	½	510172	BTS-100K	
R71	330KΩ	½	510181	BTS-330K	
R72	47000Ω 5%	½	510148	BTS-47000 5%	
R73	82KΩ	½	510171	BTS-82K	
R74	220KΩ	½	510179	BTS-220K	
R75	150KΩ	½	510176	BTS-150K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Stewart-Warner Part No.	IRC Part No.	NOTES
R76	10KΩ	1	510154	BTS-10K	
R77	18KΩ	1	510159	BTS-18K	
R78	68KΩ	1	510169	BTA-68K	
R79	2.2MΩ	2	510181	BTS-330K	Note 3
R80	15KΩ	3	510356	BTB-15K	
R81	3, 3Ω	3	510735		

* Items R58A, R58B, R59C, C58A, C58B, C58C and C58D are combined in one unit.
Note 1: Not used in some versions.
Note 2: Some versions use a 1Meg resistor in this application.
Note 3: Chassis with serial numbers 106, 601 and below, use a 470KΩ resistor in this application.
Note 4: Used in chassis bearing serial numbers above 106, 601.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA Stewart-Warner Part No.	Halldorson Part No.	Merit Part No.	RCA Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
T1	117VAC @ 1.37A	800VCT @ .180ADC	5VAC @ 3A	523973	P-9715 ①	P-3073 ①			26R34 ①③	R-48H8
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC @ 1.2A	6.3VAC @ 5.8A								

① Tape low voltage tape on HV secondary.
② Drill new mounting holes.
③ Alternate power trans. Use in chassis bearing serial no's. below 106, 701.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	Stewart-Warner Part No.	Halldorson Part No.	Merit Part No.	RCA Part No.	Ram Part No.	Stancor TYPE No.	Thordarson Part No.	Triad Part No.
T2	Vert. Osc. Trans.	532674	B6702	A-3003	209T1 ①	Y405	A-8125	26A03	A-97X
T3	Horiz. Output Trans.	532469	P9419* ②	B9D-32* ②	232T1* ①	X078* ②	A-8132* ②	FLY-39* ①	D-66* ②
T4	Vert. Output Trans.	532344	21804	A-3031	222T1	V313	A-8123	26S52	A-102X
T5A	Yoke-Horiz. (13.6MH)	522954 ③ ④	DF802.8 ⑤	MDF-72.6	21DD2 ⑤ ⑥	Y703*4/43	DY-8A ⑤ ⑦	Y-7 ⑤ ⑥	Y-17-1 ⑤ ⑥
B	Vert. (36MH)	523693 ③ ⑤				⑥ ⑦			

① Drill new mounting hole(s).
② Use original mounting bracket.
③ Includes capacitor C78; resistors R66 and R67.
④ Used in chassis numbered above 106, 701.
⑤ Alternate yoke. Used in chassis numbered below 106, 701.
⑥ Use original rear cover and centering device.
⑦ Remove damping capacitor from terminals #1 and #2. Use original horiz. damping network, if necessary.
⑧ See instructions packed with unit pertaining to yoke damping network.
⑨ Connect horiz. damping network across terminals #3 and #7. Use original network, if necessary.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	8	8	HV Rect. Plate Lead	8	8	HV Rect. Plate Lead	8
7	7	7	10	7	7	3	7
6	Jumper 6 & 5	Jumper 6 & 5	6	Jumper 6 & 5	Jumper 6 & 5	Jumper 3 & 10	Jumper 6 & 5
5	4	4	7	4	4	9	4
3	3	3	5	3	3	6	3
2	1	1	Note ⑩ 1	1	1	4	1
1 (HG)	NC	NC	NC	NC	NC	NC	NC
Special Note:			⑩				

⑩ Remove yoke return (red lead) from its present terminal and connect it to terminal #4 of trans.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC	Stewart-Warner Part No.	REPLACEMENT DATA Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T6	4.3KΩ	3.2Ω	509376	21U7	A-3930	A-3877	22S48	S-3X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA Stewart-Warner Part No.	QUAM Part No.	NOTES
SP1	6"	PM	3.2Ω	509398	6A1	① Used in models 17T-9620A and 17T-9630B.
	5"	PM	3.2Ω	522459 ①	3A07	② Used in models 21C-9630C, 21C-9630CB and 21C-9630D.
	6" X 9"	PM	3.2Ω	508174 ②	6A3	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	Stewart-Warner Part No.	MEISSNER Part No	MERIT Part No.	MILLER Part No.	NOTES
L1A	Ant. Coil	00CT	0Ω	520702				Channel 2
B	Ant. Coil	00CT	0Ω	520703				Channel 3
C	Ant. Coil	00CT	0Ω	520704				Channel 4
D	Ant. Coil	00CT	0Ω	520705				Channel 5
E	Ant. Coil	00 CT	0Ω	520706				Channel 6
F	Ant. Coil	00CT	0Ω	520707				Channel 7
G	Ant. Coil	00CT	0Ω	520708				Channel 8
H	Ant. Coil	00CT	0Ω	520709				Channel 9
I	Ant. Coil	00CT	0Ω	520710				Channel 10
J	Ant. Coil	00CT	0Ω	520711				Channel 11
K	Ant. Coil	00CT	0Ω	520712				Channel 12
L	Ant. Coil	00CT	0Ω	520713				Channel 13
L2	Neut. Coil	0Ω		530701				
L3	Fil. Choke	0Ω		530518				
L4A	RF, Mixer Grid & Osc. Coils	0Ω		520722				Channel 3
B	RF, Mixer Grid & Osc. Coils	0Ω		520723				Channel 3
C	RF, Mixer Grid & Osc. Coils	0Ω		520724				Channel 4
D	RF, Mixer Grid & Osc. Coils	0Ω		520725				Channel 5
E	RF, Mixer Grid & Osc. Coils	0Ω		520726				Channel 6
F	RF, Mixer Grid & Osc. Coils	0Ω		520727				Channel 7
G	RF, Mixer Grid & Osc. Coils	0Ω		520728				Channel 8
H	RF, Mixer Grid & Osc. Coils	0Ω		520729				Channel 9
I	RF, Mixer Grid & Osc. Coils	0Ω		520730				Channel 10
J	RF, Mixer Grid & Osc. Coils	0Ω		520731				Channel 11
K	RF, Mixer Grid & Osc. Coils	0Ω		520732				Channel 12
L	RF, Mixer Grid & Osc. Coils	0Ω		520733				Channel 13
L5	Fil. Choke	0Ω		530520				
L6	RF Coil	0Ω		520714				
L7	Int. Video IF	.9Ω		520734				
L8	RF Choke	1.3Ω		530715				
L9	2nd. Video IF	.3Ω	.4Ω	520977	17-1063	TV-116	6249	Slug core part #507357
L10	3rd. Video IF	.3Ω	.4Ω	522781	17-1063	TV-116	6250	Slug core part #507357
L11	4.5MC Trap	1.5Ω		509603	17-2400	TV-151	1469	Slug core part #507357
L12	Series Peaking Coil	9.8Ω		530689	19-3180	TV-184	6180	196 Microhenries
L13	Shunt Peaking Coil	14Ω		508343	19-5400	TV-188	6648	400 Microhenries
L14	Sound IF	.9Ω		509878	16-3465 *	TV-113 *	1470-A	
L15	Ratio Det.	3.7Ω	.80CT	509796	17-3480	TV-115 m		Tertiary winding-.4Ω
L16	Horiz. Osc.	32Ω	87Ω	532518	20-1401 s	TV-181 s	6182A	Waveform winding-44Ω

* Use one winding only.
s Use adaptor plate.
A Reverse coil mounting in can.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (@ CURRENT 1000 ~)	REPLACEMENT DATA Stewart-Warner Part No	Halldorson Part No	Merit Part No	Stancor Part No.	Thordarson Part No.	Triad Part No
L17	.180ADC	105Ω	3.34HY	532808			C-2325 ①		C-15X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Stewart-Warner Part No.		LITTELFUSE Part No.		BUSS Part No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T	1/4A 250V	508063		318.250 (3AG-P/T-1/4A)		GJV 1/4	

CRYSTAL DIODES

ITEM No	ORIG. TYPE	REPLACEMENT DATA Stewart-Warner Part No	SYLVANIA Part No	NOTES
M2	1N64	509386	1N60 or 1N32	Video Det.

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Stewart-Warner PART No.	NOTES
M3	Tuner	522931	VHF- Used in chassis with serial number 106, 701 or above. Chassis with serial number below 106, 701, use Stewart-Warner part #522514.
M4	Video Det. Assy.	522703	Includes M2, coils, capacitor and resistor. In some versions series peaking coil is omitted.
M5	Switch	520563	Local-Distance (DPDT-Slide Type) Not used in some versions.
M6	Centering Device	521267	Includes back cover of yoke
M7	Ion Trap	523011	Used in chassis with serial number 106, 701 or above. Chassis with serial number below 106, 701 use Stewart-Warner part #521183.
	Cabinet	522531	Model 17T-9620A
	Cabinet	522541	Model 17T-9620B
	Cabinet	522951	Model 21C-9630C
	Cabinet	522952	Model 21C-9630CB
	Cabinet	522960	Model 21C-9630D
	Cabinet	522941	Model 21T-9630A
	Cabinet	522942	Model 21T-9630AB
	Knob	520632-C	Channel Sel. - Models 17T-9620A, 17T-9620B
	Knob	522997	Channel Sel. - Models 21C-9630C, 9630CB, 9630D, 21T-9630A, 9630AB
	Knob	520634-B	Fine tuning - Models 17T-9620A, 9620B
	Knob	522999	Fine tuning - Models 21C-9630C, 9630CB, 9630D, 21T-9630A, 9630AB
	Knob	520633-C	On-off-Volume- Models 17T-9620A, 9620B
	Knob	522996	On-off-Volume - Models 21C-9630C, 9630CB, 9630D, 21T-9630A, 9630AB
	Knob	520635-B	Picture - Models 17T-9620A, 9620B
	Knob	522998	Picture - Models 21C-96306, 9630CB, 9630D, 21T-9630A, 9630AB
	Safety Glass	522497	Models 17T-9620A, 9620B
	Safety Glass	522332	Models 21C-9630C, 9630CB, 9630D, 21T-9630A, 9630AB
	Mask	522517	Model 17T-9620A
	Mask	522498	Model 17T-9620B
	Mask	522645	Model 21C-9630D
	Mask	522937	Models 21C-9630C, 21C-9630CB, 21T-9630A, 21T-9630AB

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DENVER, COLORADO

TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V12, V13, V14 and V15. Check M1 fuse. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C75, C76, C74, R80 and other associated components.	Check L16, C70, C73, C 71, R73, R78 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V13, V14 and V16. Check C73, R80, R78, T3, T5A and other associated components.

BLOOMING

Check by substitution V13, V14, V15 and V16. Check C73, R80, R82 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

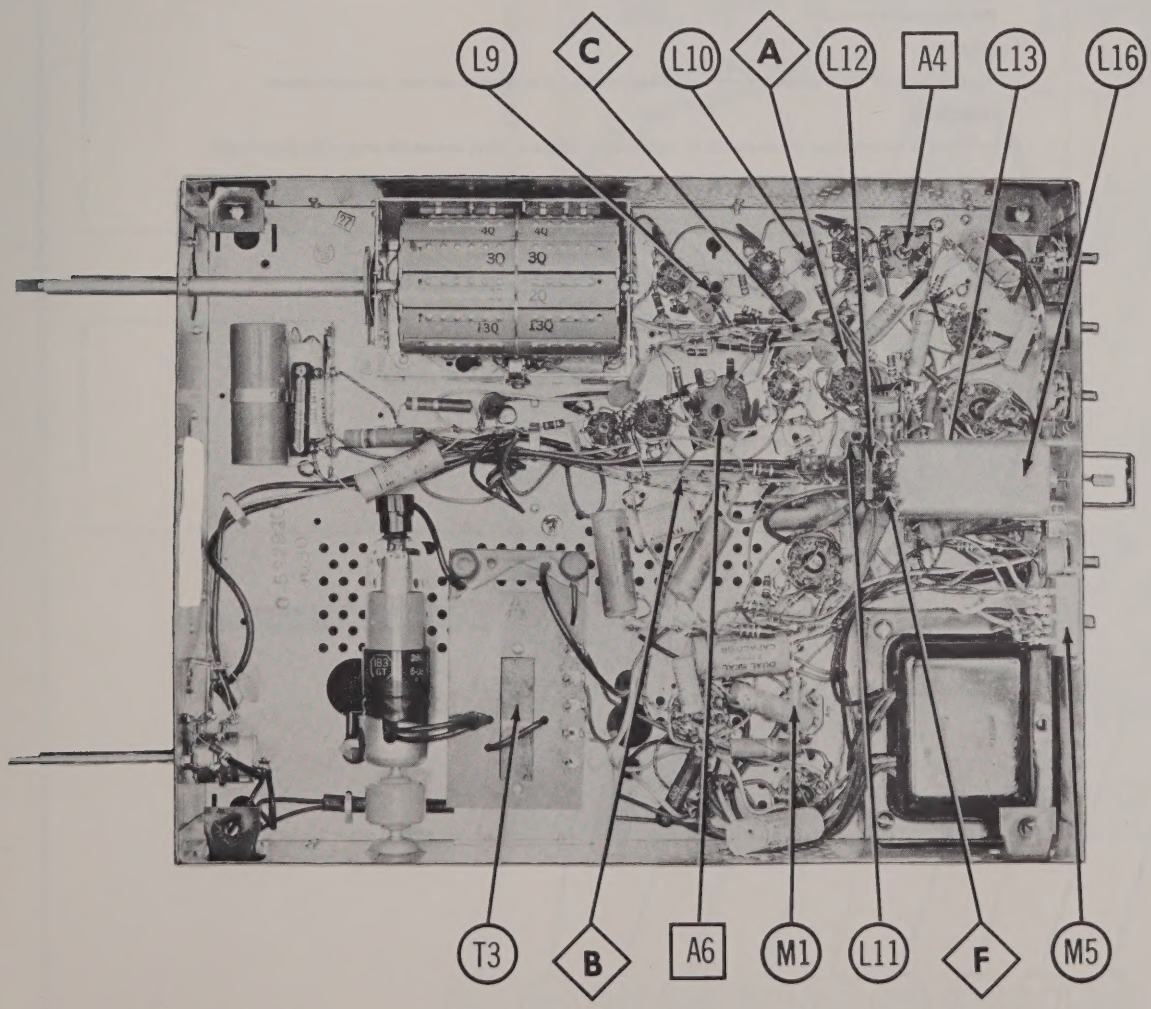
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustmens are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

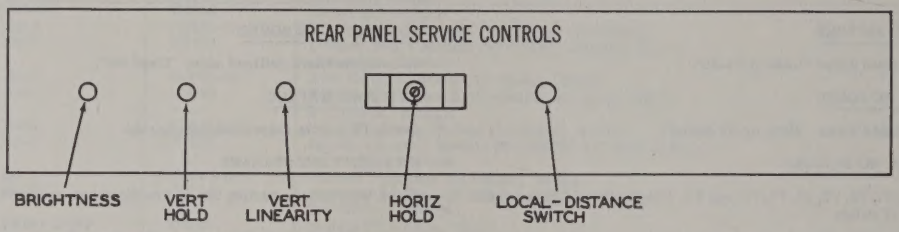
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 wood screws holding wood strip at the top of the safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from rear panel of the chassis. Adjust the horizontal freq. slug (L16) (which is labeled horizontal hold control) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L15) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.
2. Remove 1 metal screw. Remove rear cover.
3. Disconnect speaker plug.
4. Remove 4 chassis bolts. Remove chassis.
5. Remove 2 speaker nuts. Remove speaker.

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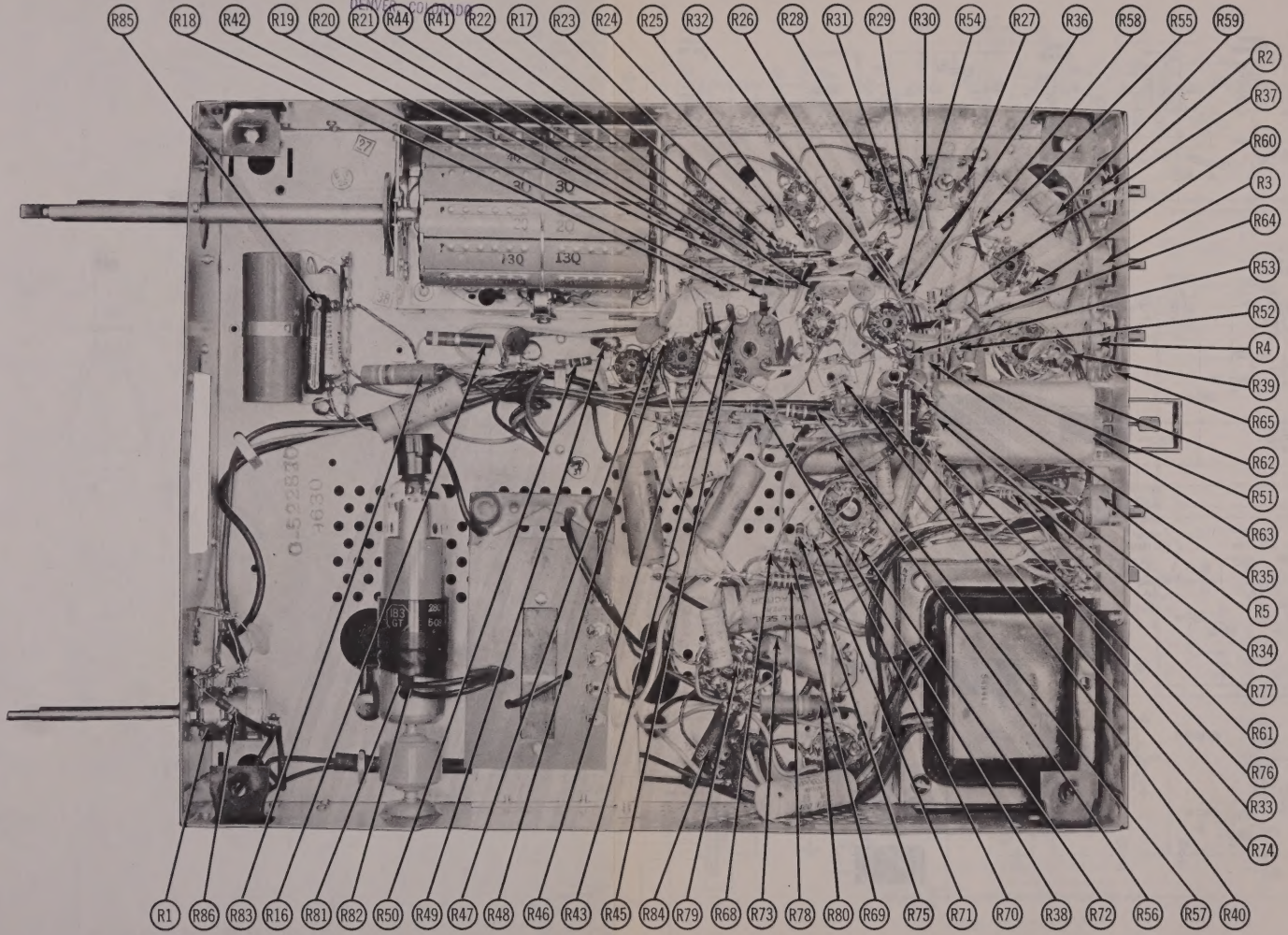

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION